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Home Accident Prevention*

Panel Discussion †

Role of the State Health Officer

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The divisions of the department most active in some of the phases of accident prevention are: Vital Statistics, Health Education, Maternal and Child Health, Public Health Nursing, Mental Health, Local Health Services, and Environmental Sanitation.

Others exercise specific regulatory or licensure functions with regard to hotels, restaurants, lodging houses, resorts (boats), hospitals, rest homes, nursing homes, etc.

Most state departments of health have already developed many of the public health tools necessary in assuming their responsibility in accident prevention as outlined by the Committee on Administrative Practice of the A.P.H.A. This has been referred to in the report of the New York State plan prepared by your chairman and reprinted in the September, 1949, issue of the *American Journal of Public Health*.

In essence, it is the responsibility of a state department of health to establish a pattern for carrying out the following functions:

1. Education
2. Epidemiological investigation
3. Detection and protection of the accident-prone
4. Research on cause and prevention
5. Consultation and coöperative planning

The Minnesota Department of Health has been active in home safety work during the last few years.

Our safety program is closely tied up with the activities of state and local safety councils, the state and local departments of Education and Social Welfare, the Fire Marshal's office, and the Industrial Commission. I think I may truthfully say that the Health Department never sets up and carries out a safety activity entirely on its own. Such activities are always organized in coöperation with one or more of these other agencies. However, the Health Department recognizes the fact that accidents rank among the foremost causes of death and disability among the citizens of our state. In Minnesota the 1948 accidental

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† Condensed version.

deaths exceeded the total deaths due to all the communicable diseases including pneumonia and tuberculosis.

During the past two years, there has been a considerable increase in the accident prevention activities of the Minnesota Department of Health. This has been due in large part to the development of the Division of Public Health Education. Through that division's personnel and facilities we have carried on an extensive educational campaign in the interests of home safety. Our monthly bulletin, *Minnesota's Health*, which is distributed without charge to 12,000 readers—about half of them non-professional people—has carried numerous articles on safety. We have sponsored radio broadcasts on farm safety, home safety, prevention of accidents among children, school safety, and *specific techniques* for safety in summer and in winter. During 1948, stories were written for newspapers and radio stations throughout the state. These stories featured the progress of the state safety campaign which had as its slogan "Save 400 lives in 1948—399 and yours."

A pamphlet entitled "Are You Safe in Your Home?" was prepared by the Department of Health in coöperation with the State Department of Education and the Minnesota Safety Council. Copies of this pamphlet were distributed to all children in the sixth grade in Minnesota schools, in connection with the regular study of health and safety assigned to that grade in the school curriculum.

One of the most up-to-the-minute developments in the way of public health education is the use of television. During the past year, the department has had a weekly television program on a local station. Several of these programs have been devoted to the showing of one or more safety films, with brief comment on the films by a member of the staff.

In September, the Health Department joined in promoting the national child safety campaign initiated by the Metropolitan Life Insurance Company. Our share in this campaign included the publication of several news items and the preparation of material for local use by public health nurses.

Beginning in February, 1948, a number of local "Health Days" were held in various centers throughout Minnesota. These occasions were arranged by local committees, with technical assistance from our health education division. At almost every one of the Health Days, one of the round table discussions featured farm and home safety.

Safety in the home and in industry was the double-barrelled theme of the 1948 exhibit by the Health Department at the Minnesota State Fair. In addition to this exhibit, numerous smaller exhibits on safety were prepared by the Division of Public Health Education for use at county fairs, in both 1948 and 1949. The same division maintains a film library, to which we have lately added several safety films. One of the most popular is "Miracle in Paradise Valley," which carries a strong message on farm safety and methods of community organization to prevent accidents on the farm and in the home. We also distribute, to schools, churches, clubs, and any other groups requesting them, films for children and parents on safety in the home, on the highway, on the playground, and in or on the water.

Needless to say, the Division of Public Health Nursing plays one of the biggest roles in any such program, because the nurses go into the homes of citizens and give them word-of-mouth information on accident prevention. Specific material on the promotion of safety and the prevention of accidents is inserted in the manual that our Division of Public Health Nursing gives to every public health nurse employed in Minnesota. The public health nurses are encouraged to work closely with local safety councils, to follow up accident

cases with a view to preventing death and restoring health, to give group instruction in safety measures, and to include safety teaching as a part of all home visits.

The Division of Maternal and Child Health is actively engaged in preventing home accidents, through literature, talks to Parent-Teacher associations, women's groups, county nursing meetings, farm, school, and other local groups. *School Health News,* a bi-monthly bulletin for school health directors, teachers, and school nurses, features safety and first aid in almost every issue. This bulletin is published jointly by the State Departments of Health and Education.

No safety program can be effectively operated without authentic information on the accident situation in the area concerned. The Division of Vital Statistics supplies this information. Detailed accidental death summaries are prepared monthly. Copies of these summaries go to the national and state safety councils as well as to the various divisions of the Health Department. A special report showing month-by-month totals for home accidents, farm accidents, and public accidents is compiled for use by the Division of Public Health Education in preparing news releases and other material on safety.

Among the most recently organized subdivisions of the Minnesota Department of Health is the Mental Health Unit. It is pretty generally recognized today that various emotional conditions predispose people to accidents. Alcoholism, depressive states, paranoid tendencies, even a recklessly euphoric condition may be the underlying cause of many accidents. In the home, many accidents may well be traceable to such conditions as fatigue, anxiety, or preoccupation with some emotional problem. Thus our mental health staff joins with the other members of the Health Department in promoting accident prevention and home safety.

In conclusion, I might add that to a large extent the activities of our Health Department staff in the field of home accident prevention are carried on in addition to their regular duties. This is not desirable but results from the lack of public funds for that specific purpose. Every state department of health should have in its budget funds specifically earmarked for accident prevention; and should have in its organization plan a division or unit staffed with trained and experienced personnel whose sole purpose is to assist in the planning and development of a state-wide accident prevention program.

Role of the Local Health Officer

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To our knowledge, the first report of a fatal accident goes back to Biblical times when: "There sat in a window a certain young man named Eutychus, being fallen into a deep sleep; and as Paul was long preaching, he sunk down with sleep, and fell from the third loft, and was taken up dead." Information is not available to me as to the date of the first motor vehicle accident death, but it cannot be more than 50 years ago —certainly within the memory of many of us in this room.

Your speaker assumed his duties as the health officer of a mid-western state in 1925, and served in that capacity for a number of years. In the late 20's we became convinced that the only solution to the problem of rapidly mounting deaths from accidents was to familiarize every person in the state with their causes and with the places, times, and

circumstances of greatest danger. In order to secure this information, a program was devised for obtaining the facts about accidental deaths and analyzing these data. In 1930, a special report form was adopted to secure information supplementary to that given on the death certificate. As a result of the use of this form and the information secured, we were able to tell the public not only how many accidental deaths there were but where the accidents occurred, what the person was doing at the time of injury, what unsafe practice was responsible, and other details which brought the accident problem down to earth.

In due time, after organization of the Nassau County Department of Health, accident prevention was included as one of the items in the program. In the beginning, the department did not have access to death certificates. However, in late 1938, the State Commissioner of Health issued an administrative order so that, effective January 1, 1939, local registrars forwarded all birth, death, and stillbirth certificates to the Health Department. In this way, we were able to secure early information about all accidental deaths which occurred in the county. However, while tabulations were and have been made for all types of fatal accidents, the department has concentrated on accidents which occurred in the home.

As a death certificate is received in the office, essential data are copied on a special report form. This form is then given to a field public health nurse who makes a home call for the purpose of securing data pertaining to the time of the occurrence of the accident, what the deceased was doing, and any factors which had a part in the causation of the fatal accident. The information secured is analyzed and interpreted so that data are available concerning the facts of fatal home accidents to the residents of Nassau County. During the past ten years the total of accidental deaths of Nassau residents numbered 2,219. Of this total 1,022, or 46 per cent, died as a result of accidents which were classified as having occurred in the home or its surroundings. Motor vehicle accident deaths numbered 695, or 31.3 per cent, and all others totalled 501, or 22.7 per cent.

The data pertaining to fatal accidents to Nassau County residents are used in many ways. A news release is prepared which gives the pertinent facts concerning these mishaps. This material is also used in the monthly bulletin which has a large number of readers in the county. Its especial value lies in the fact that the staff of the division of public health nursing and other personnel of the department uses this educational material in home visits. It is common knowledge to us in the department that the public health nurse, although her visit may be made to deliver a certificate of notification of birth registration, to give health supervision, or otherwise to teach or perform service, will find a certain accident hazard or hazards in the home, and the attention of the individual concerned will be directed to that particular condition.

An amendment by the 1941 legislature of New York State to the *Nassau County Administrative Code* placed the responsibility for the supervision and licensing of nursing homes upon the Nassau County Department of Health, effective October 1, 1941. As a means of preventing accidents and educating the management of nursing homes to the serious problem of accidents, the Nassau County Board of Health, at its regular monthly meeting held May 21, 1942, adopted a resolution which requires all nursing homes operating under license of the Department of Health to report each and every accident to the department. Upon receipt of the report the area field public health nurse then makes a visit to the nursing home and secures detailed information concerning the accident.

Over the years, therefore, the requirement of reporting of an accident by a nursing home management has made the individuals concerned safety conscious. The accident hazards in Nassau County nursing homes have been materially reduced by the work of the public health nurse and the coöperation of the nursing home proprietor.

The Nassau County Department of Health coöperates with the voluntary health agencies of the county in the general accident prevention program. The Commissioner of Health serves as chairman of Accident Prevention of the Nassau County Chapter of the American Red Cross, and also as chairman of the Health and Safety Committee of the Nassau County Chapter of the Boy Scouts. The program for the prevention of home accidents in Nassau County is a coöperative program.

Role of the Public Health Nurse

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The opportunities which are open to the public health nurse to teach and supervise the safety of families are legion. The public health nurse who is in the employ of either an official or a voluntary health agency spends a considerable portion of her day where the family congregates—that is, in the home; and it is well known that public health nurses enter more homes in any given period of time than do any other trained workers in any field. They enter these homes as a friend and adviser and they are warmly welcomed, except in very rare instances. The public health nurse, particularly when she is concerned in giving bedside or acute service, knows the family in an intimate and specific way; she knows its make-up, its relationships, its habits, its potentialities for safe living. She is, indeed, for the time being, a member of that family for she is "at home" in its bedroom, kitchen, and bath. She walks up and down its stairs and turns its lights on and off; she sees the child pick up the knife his sister put down when the telephone rang and the housewife who snatches a tea towel in place of a holder to take a boiling pot off an open flame; she sees the razor blade left on the washstand in the father's rush to catch his bus, and the puppy making a meal of the electric wire on the floor lamp. She may render first aid to the postman who turns his ankle on the marble, or she may herself be the very one who falls over the roller skates that were left in the entry way.

It is often the public health nurse who gives follow-up care to the patient with the burn which the physician has dressed, or to the youngster who has just come home after a period of hospitalization which resulted from the collision of his bicycle with a car. Such situations as these are ready-made for preventive teaching.

But the work of the public health nurse is not confined to the home. She is in the school as well, where she sees the stampede at lunch time down the poorly lighted stairs or the result of inadequate safety teaching and supervision when hammers and saws are brought out to build a new cage for the rabbits in the second grade.

Accidents which occur in school or industry are closely related to the home, of course; their cause may stem from the home and their end result will most certainly be felt there. Therefore, public health nurses in all employment situations have something to do with home safety.

The very nature of the work of the

public health nurse places her in a strategic position to prevent accidents from happening, and it makes little difference whether these accidents involve the disposal of worn-out fluorescent lights or half used medications; whether they are due to structural defect of a building or the habits of people, such as the child who runs with an all-day sucker in his mouth, the mother who leaves open safety pins within easy reach of her preschool child, or the man who reaches for the top shelf aided by one box piled on top of another or the boy who takes the radio with him to while away the tediousness of his bath.

There is little question but that the public health nurse has the *opportunity* to contribute importantly to the work of the accident prevention team. On-the-spot teaching, which is practical and understandable by all members of the family is her best technique. There are many occasions when she can also play an important role in the epidemiology of accidents because she already knew well the family or individual before the accident happened or, if not, because she has the methods at her finger tips which will help her to learn to know them quickly.

The public health nurse can be a valuable member of the accident prevention team in still another way—by learning to spot the accident-prone individual and get him under care. She sees the industrial worker and school child week in and week out, coming again and again for first aid or returning after repeated absences due to accidents. She visits the family at home for innumerable reasons and often over a period of many months, thus seeing what happens at first hand. Not only does she know the family, the school child, the industrial worker, but they know her too. Because of this she has their confidence and they bring their problems to her. Accidents, especially repeated accidents, are certainly problems, and almost always the family is concerned by the accident-proneness of its members. Of course, they tend to make excuses to outsiders for the "unlucky" person, but there is little dissembling before the nurse whom they know and like.

The public health nurse has opportunities for all of these activities, but are they used? Are her eyes open to the chance to do spot teaching and prevention? The answer is yes and no.

In the first place, her basic program in the school of nursing fails, more often than not, to emphasize the safety factors which should be observed in everyday living. To teach a student to give medications or treatments safely is not enough. And in the second place, her specialized preparation in public health nursing is nearly as deficient. She needs continuous inservice education and help which will tend to keep her up to date, and render her work more effective along this line.

Why is it that nurses are bored so easily when safety education is brought up? Can it be that our own teaching techniques are at fault? Is it that the nurse knows so little of the work of the health officer, the sanitary engineer, and the physician that she fails to see where she fits in or has a contribution to make? Is it that she participates too infrequently in community safety projects and programs? I wonder, too, if we are expecting her to do the well nigh impossible in the time we allow her for patient contacts? One thing is sure, the nurse does need time while in the home, the school, or industry to carry out this phase of her work. We administrators in public health services have been inclined, I believe, to put too much value on the number of homes visited and the number of families or individuals contacted, and not enough upon the depth and breadth of the visit. To a certain degree, quality of visit will be good only if the nurse incorporates in all of her work with the people the tech-

niques of accident investigation and prevention. It is up to us, the administrators and teachers to see that she has the tools and the time to do this.

Role of the Sanitary Engineer

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The control of accident hazards has been primarily an engineering problem both in highway and industrial safety. It is high time now that we look to the serious problem of home accidents and to the counterpart function that the health department has in controlling environmental hazards in home safety. In this respect we have lagged twenty years behind the times and the gravity of the problem. The psychological element in accidents (often so subtle and complex that we can't put our finger on it) is something we have to consider, and is an added reason and responsibility for health department action. But, whatever may be the psychological element, health departments have a basic interest and, in truth, an inescapable responsibility in the field of home safety. They should have an active program in this field, just as labor departments have in industrial safety, traffic bureaus in traffic safety, and departments of agriculture in farm safety.

There is need for an inventory and appraisal of the large number of known hazards in the home environment, where we all have the greatest feeling—or illusion—of safety, so that those hazards that are most significant in their contribution to injury and death may receive the attention which they deserve. The National Safety Council has been laboring to assist in the much needed research in the home accident field. Its Home Safety Conference's Committee on Research and Technical Studies has indicated that it might prove useful to review the methods of industrial safety engineering to determine their applicability to the home problem. For example, in the prevention of a fall, the most common type of accident, industry has found the following to be important measures: safe floor surfaces; careful lay-out and arrangement; proper dress; task simplification to reduce fatigue. These can be adapted, with necessary variations, to home safety.

Besides studying the significance of environmental hazards in their relation both to fatal and non-fatal accidents, we must study the *ultimate* rather than the immediate significance of these hazards. When an accident occurs because a person falls from a chair in reaching a high cabinet, can we place the responsibility upon the use of a chair instead of a step-ladder, or should we place the blame on the inaccessibility of the cabinet?

We have some information on fatal accidents in some states, but the type of information needed is that relating to the huge number of non-fatal accidents which occur constantly and everywhere. Such data can be obtained through organized surveys and through special studies in connection with engineering activities. For example, housing surveys have contributed information on home accidents incidental to the appraisal procedure. And in rat-control surveys, which involve the inspection of the entire premises, supplemental studies of accident hazards and prevalence have been incorporated.

Applying our present knowledge, special inservice courses are desirable for health department staff members so that they may become fully acquainted with the causes of home accidents and the proper preventive measures. Field

visits and inspections can be used to supplement the inservice training lectures and films. A follow-up epidemiological investigation should be undertaken by health departments on all home accident deaths or non-fatal accidents on which information can be obtained. An engineer should be assigned as one member of the investigating team to analyze any physical or mechanical hazards that may be involved in each case.

The home safety activities can be integrated into current programs by incorporating investigation of accidents with routine visits into any area. The engineer can regularly include consideration of accident hazards with other activities which take him into a home—for example, a request for a water sample. The engineer can foster self-inspection of dwellings by householders for accident and fire hazards to obtain factual data on the number and type of existing hazardous conditions. To home owners and householders who desire it, the engineering division can offer a voluntary inspection service of their entire premises for safety hazards. A form has been prepared in coöperation with the Kalamazoo Home Safety Demonstration program designed to aid members of local health departments in this activity. Through local display exhibits and inspections, the most common hazards and the most practicable means of eliminating them can be demonstrated to all home owners.

The engineering division can coöperate with home architects, builders, and contractors to improve the planning, design, and construction of new dwellings or the remodeling of old. Accidents are being built into too many new homes. Much of the blame can be placed on home owners who ask for unsafe features, such as narrow, steep, or winding stairways. Although it is important to reach the architects and contractors, it is more important to reach the amateur designer and, particularly, the builder who plans more with an eye to low cost or high profits than to living safety in the home he creates. To reduce the number of built-in hazards, technical consultative services can be offered by health departments to prospective home builders or persons planning to remodel.

Manufacturers of home apppliances and furnishings should be guided toward designing their products to be safe even in unskilled or careless hands. Engineers can gain the coöperation of hardware dealers in explaining to purchasers the safe operation and maintenance of equipment. Engineers can also work with the dealer of household appliances, utility companies, and plumbers on the proper installation of equipment to eliminate the hazards commonly resulting from improper installation.

In coöperation with architects and the building and fire departments of the city, the health department can undertake a study of the need for additional regulations and for more effective enforcement with respect to safe construction, design, and maintenance of homes. Such a study should lead to the development of a *home-safety code.*

The sanitary engineer has a major and immediate role to play in the home accident prevention field. The activities I have suggested, modified to accord with local conditions, can be put into effect *now* to get the ball really rolling toward a sharp reduction in the incidence of home accident injury and death.

Role of the Director of Vital Statistics

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Statistics are a prime essential in program planning, program control, and program evaluation of home accident prevention. This holds true equally for local, state, and national levels of program activity.

The director of vital statistics should participate in planning fact finding surveys and studies on which accident prevention programs are to be based. With representatives of the divisions of administration, nursing, environmental sanitation, and education, he should develop working definitions and techniques for data collection. Where unofficial agencies such as safety councils, the Red Cross, or parent-teacher organizations are able to assist, the statistician should work with their representatives also.

At the planning stage, the director of vital statistics is usually expected to sum up the statistical knowledge of the problem under discussion. On home accidents, he finds that he has very little factual information, unless he happens to be with the Nassau County or Kansas State Health Department, or from one of the few areas which have made special studies. The number of deaths from home accidents is generally recorded by large cities and at least half of the states for Safety Council use. Between 30 and 40 per cent of all accidental deaths are the result of home accidents, with the national total running to 35,000 home accident fatalities in 1948.

Accidents other than those involving motor vehicles constitute the leading cause of death for children 1 to 14 years old, and they are second in importance for young people 15 to 24 years. (Home accidents account for about half of the deaths from nonmotor-vehicle accidents.) Falls are the most common cause of fatal home accidents, accounting for more than half of the total (53.4 per cent), and deaths of persons over 65 years represent nearly four-fifths of the fatalities from falls. These statistics suggest that the problem of home accidents should be approached selectively. To prevent home accident deaths, the program of prevention may be focused at the outset on families having in them children and old people.

Figures on non-fatal injuries are extremely limited. An annual estimate of 5¼ million persons disabled for 1 day or more is widely used. Roughly one-eighth as many such injuries disabling for 1 week or more may have occurred last year, judging by the National Health Survey of 1935–1936.

Reasonably reliable data on the total number of home accident deaths are available for the country as a whole and for many cities and states from death certificates. However, the details of how, why, and whereabouts in the home the accident happened are sketchy except for Kansas and Nassau County. There, follow-up of fatal accidents is made a health department function. Similar study of accidental deaths was begun last July by eight other states and one independent registration city which have recognized the need for more information than is contained on the death certificate. A number of other states have also expressed an interest in participating next year in such a program, which is based on the use of a special accident fatality report form by local health departments and the state bureau of vital statistics. Starting from certificates of accidental deaths, the forms when completed will contain additional facts about the cause and circumstances of the accident. The program for the collection of supple-

mental information on fatal accidents was proposed in response to the recommendation of the Conference of State and Territorial Health Officers that the U. S. Public Health Service "collect factual data upon which detailed action programs can be promulgated through the state health authorities." The supplementary report form is a tool which is available to every health department. By its use, the director of vital statistics can obtain some of the basic facts needed for prevention programs.

In planning fact finding programs, recognition should be given to the complexity of the causes of home accidents, regardless of whether they are fatal or non-fatal. The multiplicity of accidental agents which range from scatter rugs to bonfires is in contrast to the unity of the agents of typhoid fever or diphtheria. The host factors in accidents, i.e., characteristics of the accident victims, appear to be allied to those for communicable and degenerative disease, but the "accident-prone" person cannot yet be spotted before the accident occurs. No specific method of immunization against accidents exists. Knowledge of some of the personality traits shared by accident repeaters is accumulating so that it is conceivable that before long accident susceptibles may be selected for special instruction or training before they have chances to become involved in serious accidents. In compiling home accident records, the director of vital statistics will want to make provision for linking together reports of multiple accidents to the same person. These should in turn be correlated with other medical reports on the individual.

There is inconclusive evidence of the effectiveness of education programs now used for teaching home accident prevention, which suggests the need for evaluating this aspect of prevention. Environmental factors, whether physical or socio-economic, in accident causation must be considered and understood better than at present if the home accident toll is to be reduced. Are scatter rugs universally hazardous, or can they be used safely under certain circumstances?

In a sequence of accidental events, the actions of other persons than the victim are a factor to be considered, much as the well carrier is in communicable disease. An unskilled repair man can jeopardize an entire apartment house by making faulty connections to the furnace. These numerous facets of accident causation mean that factual information about home accidents must be classified according to several distinct axes. External agent, characteristics of the victims, predisposing conditions, kind of dwelling, hazardous action or condition, to name a few, are classifications which should be interrelated.

There are three general techniques for obtaining data on the frequency, circumstances, and causes of non-fatal home accidents which may be used by a vital statistics office. One is by a survey of households, in which interviewers ascertain whether or not the occupants incurred injuries within a specified period. Another is to get the facts from persons admitted to hospitals and clinics for treatment of home accident injuries. A third possible method, is by securing the coöperation of physicians in reporting, for a limited period, accidental injuries to persons whom they attend. The latter two have obvious limitations in terms of coverage, completeness, and selectivity; the first is expensive.

The Public Health Service is exploring the possibility of using the mechanism of the Current Population Survey, conducted by the Bureau of the Census, to obtain some idea of the extent and character of the home accident problem nationally. Each state or smaller area, however, faces the major difficulty of producing reliable data on non-fatal home accidents for use as a starting point for its own home accident prevention

program. A city or county which really wants to tackle the home accident problem can use the same general method on a large sample of households in its boundaries. The leaflet *Get the Facts about Home Accidents* was developed for this purpose, and it is applicable to non-fatal injuries even though it was drawn up for studying fatalities. It is to be reprinted in the near future by the National Safety Council. Advisory assistance in drawing reliable samples of households can be obtained from many state universities, technical schools, or health agencies.

The director of vital statistics will need to keep in mind such fundamentals of good statistical practice as using simple forms; collecting only the facts that can be used; following written procedures, uniform definitions and classifications; and utilizing existing resources, wherever possible, for obtaining the facts.

As groundwork for fact finding activities, the director of vital statistics may well familiarize himself with what other departments of his governmental unit and learn what unofficial groups are presently doing that relates to home accidents. Fire departments, police, building inspectors, housing authorities, medical examiners, welfare agencies, school authorities, agricultural extension service, parent-teacher groups, the Red Cross, safety councils, and insurance companies are potential allies in the fight against home accidents. They may already be exploring one of the fact finding trails.

Cleveland Health Council—25 Years

On February 15 the Cleveland Health Council had a double silver anniversary celebration. On that day the Council was 25 years old and Howard Whipple Green completed his first quarter of a century of "wise and generous leadership." He was feted by a surprise "Quaker meeting" in which his many friends testified to their "affection, respect, and gratitude" for him as a "sane yet ardent promoter of every effort for community health, patient collector of the underlying facts" and "an understanding mind which has endeared him to his associates and has inspired them with his own desire for a better city," a birthday cake and a silver name-engraved Paul Revere bowl.

Mr. Green in presenting the 25 year report of the Council paid special tribute to his staff. He summarized the Council's achievements, some of which were:

1. Meeting unmet needs such as the prenatal program of the Visiting Nurse Association, and nutrition, mental hygiene, and community nursing programs.
2. Leadership in developing the use of census tracts as a means of studying the community. Originally developed for studying infant mortality and tuberculosis and other communicable diseases, they are now vitally used by business and industry.
3. Reduction in diphtheria from 3,000 cases and 191 deaths in 1926 to 8 cases in 1949 and no deaths in either 1948 or 1949.
4. Health education programs and local health festivals in nationality centers.
5. Breaking down racial barriers through both Negro and white professional personnel in an emergency tuberculosis clinic.
6. Sound statistics as a basis for Council programs—immunization, Girl's Health Year and others. An analysis of 20,000 appendectomies hastened the decline in the appendicitis death rate—an 80 per cent reduction from 169 deaths in 1927 to 32 in 1948.

Q Fever in a Wool and Hair Processing Plant*†

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TWO naturally occurring outbreaks of Q fever among stock handlers and packing house workers in this country have been reported[1,2] in addition to several laboratory outbreaks of this disease.[3–9] Q fever has been recognized in California in endemic form[10–17] associated primarily with cattle and raw milk, and also sheep and goats.

The present paper is concerned with an outbreak of Q fever among workers of a plant engaged in the processing of wool and goat hair.

Recognition of Outbreak—On February 9, 1948, a 36 year old man, with a complaint of chills, fever, headache, cough, and pain in his back and left chest, was admitted to a hospital in Philadelphia. Serum specimens were taken on February 11, 1948, February 17, 1948, and February 18, 1948, and were kept in a frozen state until April 5, 1948, when they were submitted to the Virus Diagnostic Research Laboratory at The Children's Hospital of Philadelphia. These sera were subjected to the routine tests for viral and rickettsial pneumonias. The results of these tests are shown in Table 1. The antigens used were the viral and soluble antigens of influenza A and B, the Lygranum CF antigen (Squibb) prepared from Lymphogranuloma venereum virus, and used to test for antibodies to the psittacosis-lymphogranuloma group of viruses and the Q fever antigen (nine-mile Lederle antigen).

According to the data obtained, a tentative diagnosis of Q fever was made. Another serum was obtained on May 13, 1948, and its complement-fixation titer with the Q fever antigen was 1:256. Thus, a definite diagnosis of Q fever was established. A detailed report of this case has been published elsewhere.[18]

It was learned that the patient was employed by a wool processing company in Philadelphia. Through the efforts of the Department of Health of the City of Philadelphia,* it was established that during the first 3 months of 1948, about 30 employees of this company had been away from work because of a respiratory illness generally called "flu" or "grippe."

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-seventh Annual Meeting in New York, N. Y., October 25, 1949.

† The studies described in this paper were conducted under a Contract with the Office of Naval Research.

* We are grateful to Dr. Angelo M. Perri, Chief and Diagnostician of the Division of Communicable Diseases and to his staff for their coöperation and aid.

TABLE 1

Results of Serologic Tests on the First Patient

Date of Serum	Complement-fixation with: Influenza A Virus	Influenza A Soluble	Influenza B Virus	Influenza B Soluble	Lygranum Antigen	Q Fever Antigen	Cold Agglutination
2/11/48	<1:4	<1:4	1:4	<1:4	<1:10	<1:2	1:80
2/17/48	—	—	—	—	<1:10	1:16	1:80
2/18/48	<1:4	<1:4	1:4	<1:4	—	1:16	1:80

This was the highest incidence of illness in this plant in many years.

A visit was made by the authors to the wool processing plant and, following a conference with the manager, permission was secured to bleed all employees. Between the last week of June and the second week of July, 152 of the 186 employees were bled and their sera were tested with the antigen of Q fever. Sixty-seven of these sera gave positive reactions ranging in titer from 1:2 to 1:2,048; 39 of the sera had titers of 1:64 or higher. This was considered as indirect evidence that a large number of the employees had had contact with *Coxiella burneti*. This, combined with the findings in the first case[18] and other observations, presented below, suggested that the outbreak of illness in this plant in the winter of 1948 was due to the rickettsia of Q fever. The specificity of the complement-fixation test with the Q fever antigen will be discussed subsequently.

At the time of the bleedings, the workers were questioned as to whether or not they had had respiratory illnesses in 1948, 1947, and 1946. In the course of this and subsequent interviews, it became apparent that the information supplied by the workmen was not wholly accurate. The unfortunate delay in commencing this work, caused by the belated recognition of the first case of Q fever, made it impossible to obtain reliable information from all individuals as to the clinical and epidemiological aspects of their illness. Furthermore, the company's records on absenteeism were not complete in all instances.

Description of Plant and Employees—The plant is engaged in the processing of wool and goat hair. Raw and scoured wool is imported by the company from many countries, and wool imported by several other companies is also processed in this plant. The plant itself is subdivided into six departments: office, warehouse, blending, scouring, dyeing, and maintenance. The scouring is done at a temperature of over 200° F. for 15–20 minutes, which will presumably kill *C. burneti*. The office is separated from the actual plant by the warehouse and by a loading ramp. Most of the employees are males, since only 3 women are employed who work in the office. Among the 152 employees tested in this study, there were 91 Negroes and 61 whites.

The important findings noted during visits were:

1. Not all wool was scoured.
2. The plant operations produced great amounts of dust.

Serologic Studies—The technique for the complement-fixation test was as follows: Serially diluted serum in 0.1 ml. amounts was mixed with 0.1 ml. of suitably diluted antigen and 0.2 ml. of complement containing approximately 1.5 units, as determined by preliminary titration in the presence of antigen. The tubes were kept in the refrigerator for approximately 18 hours. After this time, to each tube was added 0.2 ml. of sensitized sheep red cells (2 per cent cells with an equal amount of amboceptor in dilution considered optimal by titration of serial dilution of amboceptor with serial dilutions of complement),

and the tubes were incubated at 37° C. for 30 min. The highest dilution of serum giving a 3+ or 4+ reading was considered the endpoint. The initial dilutions of serum (before the addition of the other reagents) were used to express the titers. All sera were first tested in low dilutions with the antigen of Q fever. Sera which reacted in the preliminary test, and some of those giving negative results, were subjected to quantitative complement-fixation tests using several antigens. These included the Q fever antigen, influenza A and B soluble antigens,[19] and the Lygranum antigen. A few were also tested with the antigen of epidemic typhus. A number of sera were also tested by the Kolmer test technique for syphilitic antibodies through the kindness of the clinical laboratories at The Children's Hospital of Philadelphia and Hahnemann Hospital.

TABLE 2

Frequency Distribution of Titers among the Workers

Titer	Number Ill	Number Not Ill
<1:2	7	78
1:2 – 1:4	1	4
1:8 – 1:16	3	9*
1:32 – 1:64	5	14
1:128 – 1:256	14	5
1:512 – 1:1,024	6	3
1:2,048	1	0
Totals	37	115*

* Two sera had titers of more than 1:8, but the amount was insufficient for further titration.

Table 2 shows the titers obtained with the Q fever antigen in sera from workers classified as "ill" or "not ill" during the period of the outbreak. This classification is based largely on the statements of the workmen obtained during the preliminary questioning.

As can be seen, among the 37 individuals classified as having been ill, there were 30 whose sera reacted with the antigen of Q fever, whereas among the 115 reporting no illness, there were 35 whose blood contained antibodies to this antigen. The presence in the second group of a substantial number of sera with antibodies to *C. burneti* suggested that a number of workers had inapparent infections or illness of such mild character that they did not remember it. A graphic presentation of the frequency distribution of titers among the two groups of workers is given in Figure 1. The two distinct peaks may be taken to indicate that the milder or inapparent infections produced a weaker immune response. This possibility was tested by determining the relationships between duration of illness, as stated by the individual, and height of antibody titer.

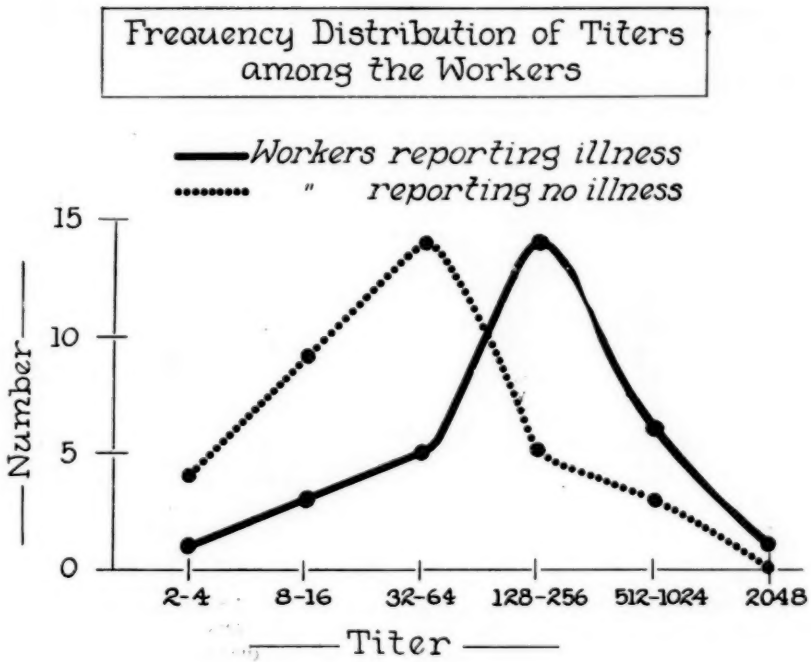
However, as shown in Table 3, such a relationship could not be established. This may have been due to two factors: (1) the small number of cases in each category; (2) the lack of accurate information (as outlined above) as to the exact dates of onset and exact duration of illness. Still, the data in Table 3 do not rule out a possible relationship between severity of the disease, as measured by duration of illness, and the height of antibody titer. Thus, the hypothesis that the lower titers in the group classified as not ill were due to a mild or inapparent infection at the time of the outbreak cannot be excluded. Nevertheless, there exists the possibility that those men with lower titers had been infected at some time previous to the outbreak. Complement-fixing antibodies to *C. burneti* appear to decline rather

TABLE 3

Frequency Distribution of Titers According to Duration of Illness

	Ill up to:				
Titer	5 Days	10 Days	15 Days	20 Days	30 Days
1:2 – 1:4	1	–	–	–	–
1:8	–	1	–	–	–
1:16	–	1	1	–	–
1:32	–	–	3	–	–
1:64	–	1	–	–	1
1:128	2	1	–	–	1
1:256	–	5	2	–	3
1:512	–	1	–	1	1
1:1,024	–	–	1	1	1
1:2,048	–	1	–	–	–
Totals	3	11	7	2	7

FIGURE 1



slowly. Sulkin and Strauss[20] reported on the persistence of complement-fixing antibodies 17 months after infection. In the present study, antibodies were found in sera from workers bled from 7 to 9 months after the outbreak. The titers are recorded in Table 4. It appears that although most titers, especially the higher titers, had declined by about ½ to ⅛ some were of the order of magnitude found in early convalescence. In view of the persistence of complement-fixing antibodies for a long time after infection, it is plausible that those workers with low antibody titers who were allegedly not sick during the outbreak might have been infected at some time in the past.

The results with the second serum of patient S. S. in Table 4 are of special interest; this individual had a titer of 1:1,024 to 1:2,048 6 months after onset, as well as 9 and even 14 months after infection. This man has complained frequently, long after his acute illness of fatigue and myalgia. It is felt that he may have had a chronic infection with *C. burneti*. In February, 1949 (13 months after the beginning of the outbreak), and again in April, S. S. received two courses of aureomycin. Following this he felt better and a serum taken in June showed a drop in titer (1:256–1:512). Although it cannot be proved, it is quite possible that the improvement associated with the fall in antibody titer was due to the treatment.

In order to test the possibility that other agents (such as influenza or members of the psittacosis group) might have caused some illnesses, and to check on the specificity of the complement-fixation reaction for Q fever, the sera were tested in complement-fixation tests with

TABLE 4

Comparison of Q Fever Titers in Two Series of Sera Taken 4–6 Months and 7–9 Months after Outbreak

Number	Patient	Illness	Serum 1 Taken	Titer	Serum 2 Taken	Titer
10	A.R.	Yes	5	1:32	8	1:32
15	I.S.	Yes	6	1:1,024	9	1:128
17	J.R.	Yes	5	1:256	8	1:128
20	P.V.	Yes	4	1:512	7	1:128
21	M.B.	Yes	6	1:512	9	1:128
33	E.S.	Yes	5	1:128	8	1:64
35	W.Walk	Yes	5	1:512	8	1:128
40	S.V.	No	4–6	1:8	7–9	1:4
42	H.D.	No	4–6	1:64	7–9	1:32
43	O.W.	No	4–6	1:256	7–9	1:64
46	A.D.	No	4–6	1:4	7–9	1:4
47	J.H.	No	4–6	1:1,024	7–9	1:128
48	A.W.	Yes	5	1:8	8	1:8
50	H.I.	Yes	5	1:256	8	1:64
56	J.W.	Yes	6	1:16	9	1:16
79	P.D.	No	4–6	1:16	7–9	1:16
107	R.R.	No	4–6	1:64	7–9	1:32
115	W.R.	Yes	6	1:4	9	1:8
142	S.S.	Yes	6	1:1,024	9	1:2,048
145	J.M.	No	4–6	1:2	7–9	1:2
151	T.M.	Yes	5	1:256	8	1:64
153	F.A.	No	4–6	1:512	7–9	1:128
156	C.H.	Yes	4	1:1,024	7	1:256
174	G.C.	No	4–6	1:32	7–9	1:4
182	E.S.	No	4–6	1:64	7–9	1:64
183	J.Q.	No	4–6	1:8	7–9	1:8

the influenza, typhus, Lygranum, and Kolmer antigens. These results indicated that neither the influenza viruses nor the members of the psittacosis-lymphogranuloma group played an etiologic role in this outbreak. Sera of 8 individuals who stated that they were ill during the period of the outbreak but who, according to the complement-fixation results, did not have Q fever, either failed to react or reacted in only low dilution with the Lygranum and influenza antigens. These reactions were of the order found in any random sample of the population at large. In general, there was no correlation between such reactions and the presence or absence of antibodies to *C. burneti*. None of the sera tested reacted with the typhus antigen (yolk-sac preparation). A small number of sera of workers with and without serologic evidence of Q fever gave positive reactions with the Kolmer antigen. It was known that some of these were getting antiluetic treatments.

In regard to the significance of titers to *C. burneti* in single serum specimens, we feel that titers of 1:128 and higher are certainly diagnostic. A titer of 1:64 or 1:32 may also be indicative of recent infection, while titers of 1:8 to 1:16 are considered of doubtful diagnostic significance and may actually represent infection in the past. Titers of less than 1:8 are considered insignificant. Some of our sera with low titers were sent to Dr. R. J. Huebner * at the National Institutes of Health for a comparative testing. Table 5 shows the results of complement-fixation tests on several sera obtained in this laboratory and at the National Institutes of Health.[21]

Clinical Observations—Owing to the paucity of clinical records on the individuals involved in this outbreak of Q fever, our clinical data are incomplete and not always reliable. In general, the illness was very mild, and the workers believed they had colds or "flu." Only

* We are grateful to Dr. R. J. Huebner for performing tests on these sera.

TABLE 5

Comparison of Titers with Q Fever Antigens in Sera Tested at the Virus Diagnostic Research Laboratory and at the National Institutes of Health

Number	*VDRL Results*	*NIH Results*
41S	1:16	1:16
46	1:4	Neg.*
48	1:8	Neg.*
70	1:16	1:16
79	1:16	1:16
84	1:32	1:16
91	1:32	1:16
119	1:32	1:32
121	1:16	1:8
126	1:8	Neg.
141	1:4	Neg.*

* Partial reactions obtained in lower tubes.

2 workers were hospitalized and a small number were seen by physicians. Only one physician remembered one of the patients as presenting a bizarre clinical picture which, according to the doctor, did not quite fit the usual course of influenza or grippe. The illness of one of the hospitalized patients was described in a previous publication [18] and mentioned earlier in this paper. The other patient was treated at another hospital, where he was admitted on March 5, 1948, and discharged on April 10, 1948. The diagnosis of his illness was "lobar pneumonia." This patient, whose pneumonia was complicated by pleural effusion, had fever, dyspnea, and slight cyanosis. Pneumococci were found in the pleural fluid on March 31, 1948. The severe pneumonia in this individual may have been a secondary infection superimposed on the Q fever. Three cases with pleural effusion were noted during the studies on Q fever in California.[14]

All men admitting to illness were questioned and their symptoms and signs tabulated. These are shown in the following chart:

Signs and Symptoms as Related by 28 Workers

Fever	21
Sweats	21
Chills	20
Generalized aching	18
Sudden onset	16
Headache	12
Cough	9
Anorexia	9
Sore throat	6
Chest pain or discomfort	4
Diarrhea	3
Bloody sputum	0
Abdominal pain	0
Constipation	0
Epistaxis	0

Although as stated earlier, the accuracy of the information is open to some question, nevertheless the most prominent symptoms, i.e., feverishness, sweats, chills, and malaise reported by this group were the same as those described as most common in other outbreaks.[22-25]

It is interesting that, although our first patient [18] complained of a severe headache, and though reports of other outbreaks listed headache as one of the most prominent symptoms, only 12 of

TABLE 6

Frequency Distribution of Titers According to Year of Start of Employment

Year Employment Began	*Titer*						
	<1:2	*1:2–1:4*	*1:8–1:16*	*1:32–1:64*	*1:128–1:256*	*1:512–1:1,024*	*1:2,048*
1948 April or later	21	1	–	–	–	–	–
1948 Before April	4	–	–	1	–	1	–
1947	21	2	2	8	6	2	1
1946	14	1	4	2	7	2	–
1945	2	–	2	3	1	4	–
1944	4	1	2	1	–	–	–
Before 1944	13	–	2	2	4	–	–
No Date	6	–	–	2	1	–	–
Totals	85	5	12	19	19	9	1

the workers said they had had a headache. Shepard[2] noted a similar situation, in that most patients in the Chicago outbreak, when interviewed after their return to work, did not mention having had headaches.

According to the statements received during the interviews, the average number of days of illness was approximately 14 for the patients with Q fever. This figure is higher than the average reported by other investigators and probably represented the time of illness plus convalescence, i.e., absence from work rather than the period of fever. Patients showing no serologic evidence of this disease had illnesses of approximately 2 days. The disease was rather mild and, as shown in Table 2, there appeared to have been at least 8 individuals with inapparent illness. Possibly all 22 workers with a titer of 1:32 or higher in the non-ill group might have had inapparent infections. There was no correlation between the frequency or severity of illness and the age of the workers.

Epidemiological Features—The interviews of the employees at this plant revealed that 9 were ill in January, 14 in February, and 5 in March. One worker who was employed on December 31, 1947, and another who started early in January had Q fever. This indicates that *C. burneti* was present at this plant after December 31, 1947. The epidemiologic data do not warrant a conclusion about the presence or absence of this agent prior to January, 1948.

Table 6 shows the distribution of titers according to length of employment. The important finding is that the only group of workers not showing evidence of past infection were those who commenced employment after March, 1948. The incubation period has been reported by other investigators to range from 14 to 32 days. Since the wool and hair is processed rather quickly (a bale is completed the day it is opened—3 trucks of hair may be processed in a day), we

TABLE 7

Incidence of Q Fever in the Several Departments Based on Serologic Tests

Department	Number Tested	Number of Q Fever Cases: Based on Titer of 1:32 or Higher	Number of Q Fever Cases: Based on Titer of 1:128 or Higher
Blending	36	7	3
Dye House	32	15	11
Hair Room	2	1	0
Scouring	35	8	3
Warehouse	10	9	7
Maintenance	4	1	1
Mechanics	14	7	4
Office	7	0	
No designation	3	0	
Totals	152	48	29

may assume that several batches of raw wool or goat hair handled during the month of January contained the causative agent. The company could not furnish detailed information on the sources of these materials during January. The statement from the manager read: "During the month of January, 1948, we handled wool in our plant which originated from the following countries: India, Argentina, Afghanistan, China, Tibet, Italy, Iraq, Persia, Mongolia, New Zealand, Turkey, Egypt, England, France, Greece, South West Africa, and Spain. We also process for various customers, on a commission basis, wool which they themselves have imported from the various countries."

The highest incidence occurred in the dyeing and warehouse departments and among the mechanics. Table 7 shows the incidence of infections with *C. burneti* in all departments. Raw wool was handled in the warehouse, dye house, blending and scouring departments. Furthermore, a large amount of dust prevailed *throughout* the plant, which might explain the presence of disease in all departments except in the office which was separated from the rest, since particles bearing the rickettsiae might have been present in all the working sections of the plant. In attempting to explain the highest incidences, we offer the hypothesis that the bales

handled in the dye house and warehouse may have been the only materials that were contaminated, or they may have contained the largest amount of rickettsiae. We have no explanation for the high incidence among the mechanics, except that in the course of their work they have to spend time in all departments. It should also be mentioned that workers in any department were at times assigned to other departments when there was demand for more workers at any particular job.

Reports of naturally occurring Q fever in this country [1, 2, 14] indicate association with cattle primarily, and to a lesser extent with sheep and goats.[2, 12, 14] Caminopetros [26] reported on the infection of sheep and goats with *C. burneti*. It appears that this outbreak was caused by *C. burneti* inhaled by workers handling raw wool and goat hair—presumably containing dried ticks or tick feces—in a dusty atmosphere. There was no relationship between the occurrence of cases and the age of the workers, nor was there a difference in severity in the young and old individuals. There were no known cases among the contacts or families of the workers.

DISCUSSION

The fact that this outbreak was recognized through the routine testing of serum specimens from *one patient* with an upper respiratory illness points to the importance of testing, with the several viral and rickettsial antigens, sera from patients with undifferentiated infection of the upper respiratory tract or with pneumonia. Tests with the Q fever antigen are especially important when the patient is known to have had contact with raw wool, meat, or milk, or with sheep, goats, or cattle.

Although the disease was mild, severe and even fatal cases of Q fever have been noted by other investigators. Even in its mild form, Q fever can cause great losses in man-hours. Furthermore, as exemplified by our patient, S. S., and also reported by other investigators,[14, 21, 27] the disease may be followed by complications lasting for several months.

Q fever should be recognized as an occupational hazard. The disease has now been shown to occur among stock handlers, packing house workers, and workers in the wool industry. In addition, it may be transmitted to consumers by milk.[13, 14, 17] We feel that the public health authorities, federal, state, and local, should take the necessary steps to make Q fever a reportable disease, and to extend the protection and benefits of the laws covering compensation to include Q fever.

From the standpoint of prevention of Q fever in the wool industry, several prophylactic and control measures may be mentioned. Perhaps vaccination would afford protection. Smadel, Snyder, and Robbins [28] have reported on the development of complement-fixing antibodies following vaccination of human beings. Every effort should be made to reduce materially the amount of dust produced during the various operations. A properly engineered "air cleaning" system, supplemented by ultra-violet irradiation of "purified" air, may lower the chances of infection. It would be most desirable that only scoured wool be imported into this country. This, however, may not be feasible owing to economic and commercial factors.

SUMMARY

An outbreak of Q fever occurred in Philadelphia among workers in a wool processing plant. The diagnosis was made by means of the complement-fixation test. The serologic and epidemiological features of this outbreak are discussed. It is recommended that Q fever antigen be used along with the other available antigens of pneumotropic viruses in testing sera of all cases of atypical pneumonia and undifferentiated

infections of the upper respiratory tract. To the other industrial occupations associated with the risk of acquiring Q fever (dairy, meat, stock handling) must be added the occupation of handling and processing of raw wool and goat hair.

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The Problem of Standardization of BCG Vaccine*

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ALTHOUGH BCG vaccine has been used widely as an immunizing agent for over 25 years, there remain many problems dealing with its preparation, preservation, and standardization.

The differences in results obtained by various investigators, with special reference to dose of vaccine, character of the local reaction and incidence and persistence of the post-vaccinal tuberculin reaction, make it advisable to study more precisely the technique used in the preparation of BCG vaccine and to develop methods for evaluating its potency.

CHARACTERISTICS OF THE BCG CULTURE

The culture, from which BCG stems, was isolated from the udder of a tuberculous cow by Nocard and was originally designated "lait Nocard." Its degree of virulence was such that the injection of 3 mg. intravenously was fatal to young calves. This culture was transplanted to potato soaked in beef bile containing 5 per cent glycerine and after 230 transplants on this medium, in the course of approximately 13 years, it had lost its ability to produce progressive tuberculosis in animals as susceptible as guinea pigs.

Studies have indicated that this attenuated strain now designated as BCG (B. Calmette-Guerin) retains all the characteristics of virulent strains of tubercle bacilli except their ability to produce progressive tuberculosis. Chargaff [1] has found that the BCG culture differs chemically from virulent human and bovine types of tubercle bacilli in that it contains a higher per cent of total lipids and chloroform-soluble waxes but the same per cent of phosphatides and polysaccharides as the virulent strains.

Calmette and Guerin [2] attributed the loss of virulence of the original culture to its repeated transfer to bile-containing medium. What effect, if any, bile may have on attenuating tubercle bacilli is a moot question. Steenken, Oatway, and Petroff [3] describe the dissociation of the H 37 strain, after it was grown on bile-potato medium for 4 months, into avirulent R colonies and virulent S colonies. Smithburn [4] found that a number of recently isolated human type tubercle bacilli were rather uniform in their pathogenicity. On the other hand, of 12 bovine strains studied, virulence was most marked in the most recently isolated strains, while some, but not all, of the older strains were so attenuated as to produce retrogressive lesions in both rabbits and guinea pigs. None of these cultures had been grown on bile medium. Frimodt-Möller [5] has reported the dissociation of two originally dysgonic, bovine strains grown on Löwenstein's and on Petroff's medium but not on bile-containing medium. From these two cul-

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-seventh Annual Meeting in New York, N. Y., October 27, 1949.

tures, he isolated eugonic variants which resembled the BCG culture both as to virulence and growth characteristics. One of us (J.D.A) has observed that certain strains in our collection have gradually lost their virulence for the usual laboratory animals. The decrease of virulence varies with different strains and with some strains has been gradual, extending over a period of years. This we have observed with the Bovine III strain isolated in 1903 by Dr. Theobald Smith. On the other hand, a bovine strain isolated from the cervical lymph nodes and spleen of a horse, while highly virulent for rabbits and guinea pigs when first isolated, underwent a rapid attenuation after several transplantations on the usual glycerine agar medium. We have noticed that recently isolated avian strains have also shown a rapid loss of virulence for rabbits.

Our cultures of BCG have been obtained directly from the Pasteur Institute, Paris. In the experience of one of us (J.D.A.) since 1928, guinea pigs injected by various routes with from 1 to 20 mg. moist weight of the BCG culture have usually developed well defined local lesions, but in no instance has there been observed any evidence of progressive tuberculosis. While it is the consensus that the BCG culture is avirulent, and in that sense may be considered a virus fixé, its cultural characteristics vary as do those of other bacteria. Petroff, Branch, and Steenken [6] succeeded in dissociating the BCG culture into R colonies which were nonpathogenic for guinea pigs and S colonies which they claimed were pathogenic for these animals. While other investigators have confirmed the dissociation of this culture into the R and S colonies and into intermediate types of colonies, no one has corroborated the claim made by Petroff, Branch, and Steenken that the BCG culture was pathogenic for animals.

Over a period of years we have observed marked differences in the character of growth of BCG cultures. The rate, luxuriousness, and character of growth on potato medium soaked in either 5 per cent glycerine or Sauton medium varies within wide limits. These variations may be due to differences in the chemical and physical properties of the potato and its maturity or to the length of time of storage. In recent years our BCG culture has grown more rapidly and luxuriantly on Sauton medium than previously. Ordinarily in from 4 to 5 days the culture covers the surface of a 50 ml. flask, containing 25 ml. of Sauton medium, with a thin film which extends to the sides. Within the next 48 hours the film becomes thicker, the surface is wrinkled, waxy, dry, and has a yellow or tan color. The inoculated culture medium, which formerly developed a well marked yellow color, has in more recent years assumed a straw color or has remained colorless. From time to time we have observed definite opalescence in the culture medium after the culture has been grown for about 2 weeks. We have observed that the rate and luxuriousness of growth of the BCG culture is reduced if it is grown continuously on Sauton medium. Under these conditions there appear clumps of small, rough, rounded doughnut-like colonies with a central opening measuring about 3 to 5 ml. in diameter. This type of culture forms a granular suspension and when injected intracutaneously in man is followed by a significantly lower per cent of positive tuberculin reactions one year later than occurs with other cultures.

A third type of growth on Sauton medium, which we have designated hydrophilic, is characterized by the formation of a grayish white, wet, greasy appearing thick film which tends to be submerged and to form stalactites. This film falls to the bottom when the flask is shaken slightly. The hydrophilic type of culture contains 71 per cent of water in contrast to the 60 per cent found in

the waxy-like growth. Microscopically, the bacilli from the wet culture tend to be swollen, pale-staining, granular, and to contain numerous non-acid forms.

Because potato favors the rapid growth of tubercle bacilli, there is much to be said for the transfer of the BCG culture from the synthetic medium to potato. However, there is great variation in the luxuriousness of growth on different potatoes. Our observations indicate that the so-called Pennsylvania potato gives the most luxuriant growth, while the Maine potato and the Idaho potato give the least growth. We have also observed that, in general, growth is more uniform on potato during the summer months. Attempts to grow the BCG culture on carrots, rutabaga, and beets were unsuccessful. We have long discontinued the use of potato soaked in bile but have not observed any evidence of increased pathogenicity for guinea pigs.

Jensen[7] described significant differences in the virulence of two cultures of BCG obtained in 1927 and 1931 respectively from the Pasteur Institute, Paris. Vaccine prepared from the earlier culture produced large local lesions when injected, in man, in quantities of 0.01 or 0.001 mg., while the second culture gave rise only to a local nodule when 0.15 mg. was administered. Similarly the intracutaneous injection of varying amounts of these two cultures into guinea pigs indicated that the first culture was the more virulent. Neither culture, however, produced progressive tuberculosis in these animals. Jensen concluded that the continuous cultivation of the more attenuated culture on bile-potato increased its virulence to the level observed in the first culture, and that the use of bile-potato increases rather than decreases the virulence, as claimed by Calmette and Guerin.

Van Deinse[8] believes that the results obtained by Jensen can be attributed to the low vitality of the second culture, which was maintained continuously on Sauton medium, and that Jensen's results do not justify the conclusion that the bile-potato increased the virulence of the strain.

Böe[9] studied the virulence of cultures of BCG obtained from Sweden, Denmark, Norway, and the Pasteur Institute, Paris. He measured the virulence of the respective strains by determining the minimum amount of each culture which would produce a definite local lesion when injected intracutaneously into guinea pigs. The virulence of the 4 cultures was uniform despite the fact that the strain used in Sweden has been maintained exclusively on bile-potato for the past 20 years.

We have studied the virulence of the following 6 different strains of BCG obtained from different laboratories: BCG culture 186 received from Dr. J. Böe, Norway; culture 118 from Dr. K. Toderlund, State Serum Institute, Denmark; culture 793, series 2, Phipps Institute, Philadelphia, Pa., received from Pasteur Institute, Paris; culture 805 from Dr. Birkhaug, New York State Laboratory, Albany, N. Y.; culture 862 from Dr. S. R. Rosenthal, Tice Laboratory, Chicago, Ill.; and culture 425 from Dr. Wassen, Sweden. These cultures were transplanted to Sauton medium, and suspensions made from 7 day old cultures were injected intracutaneously into guinea pigs in tenfold dilutions ranging from 10^{-1} to 10^{-4} mg. of each culture. The rate of development, size, and character of local lesions were studied in each of the guinea pigs, all of which received the same dose of each culture. The results indicated that the character of the local lesions was not conspicuously different for the different strains but that in some guinea pigs local ulceration appeared earlier than in others.

The virulence of tubercle bacilli cannot be measured entirely on the basis of the minimum dose capable of producing local lesions, since due consideration

must also be given to the factor of natural resistance of the animal. Lewis and Loomis [10] have shown that the character of the local tuberculous ulcer produced by the intracutaneous injection of viable virulent tubercle bacilli into guinea pigs is related to the general resistance of the inbred family and is due to their constitutional differences. Dr. Max Lurie kindly placed at our disposal a rabbit from his tuberculosis-susceptible family and one from his tuberculosis-resistant family. Each rabbit was injected intracutaneously in the skin over the abdomen and in the skin over the back with 0.1 mg. of each of the 6 cultures of BCG. It was noted that in the susceptible rabbit the local inflammatory reaction, 24–48 hr. following the injection, was sharply defined and that the area of redness was extensive and deep red. This was most marked in the skin over the abdomen. In the resistant rabbit, on the other hand, the inflammatory reaction was less marked, diffuse, and pale red, and the edema gradually fused into the surrounding tissue. However, the inflammatory reactions elicited by the different cultures were not significantly different. With increasing time the differences in the appearance of the local lesions in the susceptible and resistant rabbits were more marked. In the susceptible rabbit the lesions were rounded, elevated, measured 10 to 12 mm. in diameter, and were raised from 3 to 4 mm. above the surrounding tissue. The rounded, marble shaped lesions were not adherent and moved freely in the surrounding tissues. On the other hand, in the resistant rabbit the lesions were flat and diffuse, measuring from 10 to 12 mm. in diameter, and raised about 1 mm. above the surrounding skin. Ulceration with discharge of caseous material was observed in the resistant rabbit 3 to 4 weeks after injection. Ulceration did not occur in the susceptible rabbit. In general, the lesions on the skin over the back of both animals were firmer and somewhat smaller than those noted over the abdomen.

While the number of animals used does not justify drawing final conclusions, we were impressed that over a long period of observation, the lesions produced by the BCG culture obtained from the different laboratories were not significantly different. Our observations are in agreement with those of Böe and indicate that the cultures of BCG obtained from 6 different laboratories are relatively uniform in their virulence, as determined by the intracutaneous injection of the cultures in both guinea pigs and rabbits. Some of the differences and irregularities which have been described in the literature may well be due to variations in the susceptibility of the animals used.

PREPARATION OF VACCINE

The procedure originally recommended by Calmette [2] has been followed implicitly by many laboratories. This consists of transplanting the culture which has been grown on potatoes soaked in beef bile containing 5 per cent glycerine, to potato soaked in 5 per cent glycerine. After 10 to 15 days' incubation, the film which has grown on the surface of the liquid is transferred to flasks of Sauton medium, where it is permitted to grow for from 8 to 10 days or until it covers the surface of the flask, when it is again transferred to a series of flasks containing Sauton medium. These flasks are incubated at 38° C. for from 20 to 25 days. The growth from this second generation on Sauton medium is collected under sterile conditions and the bacilli are suspended in 25 per cent Sauton medium to the desired concentration. According to Calmette the BCG culture when grown in flasks of 250 ml. capacity, containing 150 ml. of culture medium and under the conditions described, will yield 5 gm. of bacilli. The vaccine thus made should

be preserved in the ice box and used within 15 days.

It is customary to transfer the BCG culture after it has been grown for 10 generations on glycerine-potato to bile-potato. After two generations on bile-potato it is returned to glycerine-potato medium. The purpose of this alternation is, according to Calmette, to maintain the avirulence of the culture. Dr. Bretey [11] of the Pasteur Institute, Paris, has advised us that since 1939 the use of beef bile has been discontinued and that the BCG culture is now grown only on potato soaked in either 5 per cent glycerine or in Sauton medium.

The development of increased resistance following the administration of viable, attenuated organisms is dependent upon the initial rate of multiplication of the immunizing agent in the host. It would therefore seem logical to use a young actively growing culture of BCG for the preparation of vaccine rather than cultures which have grown for from 20 to 25 days, as recommended by Calmette. For many years we have used 7 to 10 day old cultures, for the preparation of BCG vaccine, and our studies indicate that when grown in Dubos medium, the BCG culture reaches its logarithmic peak of growth, from the 9th to 11th day.

For small scale production of vaccine, we collect the bacilli from a 7 to 10 day old culture on Sauton medium by filtering the culture through a sintered glass filter of medium porosity. The bacillary mass is collected from the sintered glass plate and transferred to sterile filter paper, where the excess moisture is removed. The bacillary mass is transferred to a piece of sterile platinum foil and the weight is determined by difference. The weighed mass is placed in a sterilized, heavy walled, globular, glass flask containing stainless steel or Monel metal balls. It is ground at first into a paste by the addition of a few drops of the diluent, after which the diluent is gradually added to bring the vaccine to the desired concentration. In addition to determining the weight of the bacillary mass, it has been our practice to determine the opacity of each lot of vaccine with the Klett-Summerson colorimeter. We have obtained a better correlation between opacity and the viability of the vaccine, as determined by the minimum amount of the vaccine capable of initiating growth in Dubos medium, than by using the weight of the bacilli in relation to viability. This difference in correlation is due to the marked variation in the size and water content of the bacilli. With a reading of 40 to 59 on the Klett-Summerson colorimeter, growth in Dubos medium was obtained with a dilution of 10^{-6} mg. in 55.5 per cent of 18 lots of vaccine, while with a reading of 60 to 79, growth was obtained in a dilution of 10^{-6} mg. in 62.5 per cent of 8 samples.

Because of the marked variation in the size of different strains of avian tubercle bacilli, Van Deinse and Hoogheimster [12] concluded that the number of bacilli, rather than the weight, should be used in preparing bacillary suspensions. We have also observed marked variation, not only in the per cent of water present in different cultures, but also in the size of the bacilli from the same strain, when samples of organism were measured from different types of growth.

We have found that the vaccine prepared by grinding the bacilli for a long period of time with stainless steel balls may have a gray or black color. That this is due to some interaction between the metal and the bacilli is suggested by the fact that none of the diluents used, such as Sauton medium, physiological salt solution, or phosphate buffer pH 7.2 are discolored when the steel balls are permitted to remain in these solutions for long periods of time or are sterilized in these solutions at 15 lb. pressure for 20 to 30 min. It is inadvisable to use glass beads or mullite balls

for making the bacillary suspension since there exists the danger of their chipping and leaving particles of glass in the vaccine. For these reasons we have been using Monel metal balls.

We have also investigated the effect of grinding on the viability, staining and morphology of the bacilli. Bacillary suspensions of 40 mg. per ml. were ground for from 5 min. to 1 hr. with either glass beads or stainless steel balls. Samples were removed after grinding for 5 min. and at 15 min. periods thereafter for 1 hr. It was found that there was no change in the tinctorial or morphological characteristics after grinding the bacilli with glass beads for 30 min. Samples examined after 45 min. to 60 min. grinding retained their tinctorial character, but the cells were definitely shrunken. Samples of vaccine ground for from 5 to 15 min. with stainless steel balls showed no change in the staining or morphology of the organisms. However, samples collected after 30 min. grinding show marked reduction of the number of acid-fast organisms and increasing numbers of non-acid-fast bacilli. After grinding for 45 or 60 min. with the stainless steel balls, the majority of the organisms have disintegrated and few acid-fast bacilli remain.

The viability of the bacteria after grinding for various periods of time with either the glass beads or steel balls was determined by adding tenfold dilutions of the ground bacillary suspensions to Dubos medium and incubating the culture for 30 days. The minimal amount of the bacillary suspension capable of initiating growth after grinding with either glass beads or steel balls is shown in Table 1.

It will be noted that grinding with stainless steel balls reduces the number of viable bacilli somewhat more rapidly than is the case with glass beads. It was also noted that there was a lag in the rate of growth of the bacillary mass, ground with the steel balls, over that observed with suspensions prepared by grinding with glass beads. The reduction of bacilli may be due to injury of the cell by grinding and in the case of the stainless steel balls the metal may have an oligodynamic action.

TABLE 1

Effect of Grinding on the Viability of BCG Vaccine

Minimal Amount in MG Capable of Initiating Growth in Dubos Medium after Grinding for Variable Periods of Time

	Time of Grinding in Minutes				
	5	15	30	45	60
Glass beads	10^{-6}	10^{-5}	10^{-4}	10^{-3}	10^{-3}
Stainless steel balls	10^{-5}	10^{-5}	10^{-3}	10^{-3}	10^{-3}

THE TUBERCULIN REACTION FOLLOWING BCG VACCINATION

To estimate the relative importance of some factors involved in the preparation of BCG vaccine, Aronson, Saylor, and Parr [13] studied the incidence of positive tuberculin reactions following the administration of 13 different lots of BCG vaccine, prepared under different conditions. A group of 1,565 Indians, ranging in age from less than 1 year to 20 years, who failed to react to the intracutaneous injection of 0.005 mg. of PPD tuberculin were injected intracutaneously with either 0.1 or 0.15 mg. of freshly prepared BCG vaccine. The different lots of vaccine used were prepared from BCG cultures grown on Sauton medium at 38° C. for from 7 to 30 days, and which had been grown on bile-free medium for from 2 to 7 generations. These preparations were generally used within the first 24 hr. and only a few persons received vaccine as old as 72 hr. The tuberculin test was repeated annually on these persons, using an initial dose of 0.00002 mg. PPD, and — if negative after 48 hr., the test was repeated with 0.005 mg. PPD and read after another 48 hr. From the beginning of this study until 1942 the PPD prepared by Dr. Florence Seibert, Henry Phipps Institute,[14] by precipitation with

trichloracetic acid was used and after that PPDS prepared by Dr. Seibert by precipitating the tuberculin with ammonium sulphate[15] was used. The PPD tuberculin was diluted each day from the concentrated solution and the injections and reactions were read by the same persons. This investigation was conducted for 11 years in some areas and 9 and 10 years in other areas. Throughout this time 1,545 persons or 98.7 per cent of the original group of 1,565, were followed. During the annual examinations, never less than 69 per cent of the original group were retested and for the first 5 years more than 90 per cent were retested each year.

In summarizing the reactions following vaccination we have grouped those which were persistently positive to 0.00002 mg. PPD or to 0.005 mg. PPD with those who reacted sometimes to one dose and sometimes to the other dose but who were at all times positive. The second group contains those who were positive one year after vaccination and who after that were usually positive, with occasional negative or doubtful reactions to 0.005 mg. PPD. Of individuals who were tuberculin-negative or doubtful one year after vaccination, there were those who never became positive, those who subsequently became and remained positive, and those who became positive and occasionally were negative or doubtful to 0.005 mg. PPD. It will be observed from Table 2 that, within the limits of this study, the incidence of the tuberculin reaction, 1 year after vaccination, is unrelated to the age of the culture, the number of generations through which the culture has been grown on bile-free medium, or the dose of vaccine used. Similarly, the persistence of the tuberculin reaction during the 9 to 11 year period of observation bears no relationship to the factors mentioned above nor to the incidence of the tuberculin reaction 1 year after vaccination. Examination of Table 2 shows that from 95 to 100 per cent of those who received vaccine lots 3, 4, 5, 6, 10, 11, 12 or 13 were tuberculin-positive 1 year later, and that the tuberculin reaction persisted throughout the period of this study in from 87 to 100 per cent of these cases. Of those who were injected with vaccine lots 8 or 9, the tuberculin reaction was positive 1 year after vaccination in 61.8 and 88.1 per cent of cases respectively and a significant per cent of these cases remained positive with occasional negative or doubtful reactions during this study. A third group, injected with vaccine lots 1, 2 or 7, present a problem of special interest. Vaccine lots 1 and 2 were used in 1936 and lot 7 in 1937. It will be noted that while the tuberculin reaction was present one year after vaccination, in 92.6 and 94.7 per cent of those injected with lots 1 and 2 respectively, in the course of 11 years of observation, a persistent tuberculin reaction was obtained in 57.7 and 66 per cent of those who received lots 1 and 2 respectively, while 35.3 and 26.8 per cent respectively gave positive tuberculin reactions interspersed at irregular intervals with negative or doubtful reactions. Similarly although 93.5 per cent of those who received vaccine lot 7 reacted to tuberculin 1 year after vaccination, a persistent tuberculin reaction over a period of 10 years observation occurred only in 69 per cent, while 23.7 per cent gave a tuberculin reaction which fluctuated from positive to negative or doubtful. It will be noted that vaccine lots 1, 2 and 7 were all used on the Pima Agency, Arizona. This instability of the tuberculin reaction among those living on the Pima Agency has been noted since the early years of our study; it was even higher among an equal number of unvaccinated controls who became positive in the course of succeeding years. The instability of the tuberculin reaction as related to different geographical areas will be reported on at a later date.

TABLE 2

Duration and Character of Tuberculin Reaction to Different Preparations of BCG Vaccine

Agency	*Lot No. of Vaccine*	*Age of Culture in Days*	*Generations after Bile*	*Dose in Mg.*	*No. Vaccinated*	*No. of Yrs. Observed*	*Total Per cent of Reactions to Tuberculin during Period of Observation*					
							Pos. 1 Yr. Later	*Persistently Pos.*	*Pos. with Occas. Neg. or Doubt.*	*Persistently Neg. or Doubt.*	*Neg. or Doubt. to Persistently Pos.*	*Neg. or Doubt. with Occas. Pos.*
Pima	1	14	7	0.15	88	11	92.6	57.7	35.3	3.5	3.5	0.0
Pima	2	21	7	0.15	169	11	94.7	66.0	26.8	0.0	5.9	1.2
Wind River	3	30	3	0.15	101	11	95.6	87.6	7.2	0.0	5.2	0.0
Wind River	4	14	3	0.15	115	11	99.1	92.3	6.9	0.0	0.8	0.0
Wind River	5	7	6	0.1	12	11	100.0	100.0	0.0	0.0	0.0	0.0
Turtle Mountain	6	13	7	0.1	170	11	98.2	85.1	13.1	0.0	1.2	0.6
Pima	7	16	2	0.15	97	10	93.5	69.0	23.7	1.1	2.1	4.1
Rosebud	8	17	4	0.15	127	9	61.8	41.8	19.7	13.4	19.4	5.5
Rosebud	9	17	5	0.15	164	9	88.1	71.4	16.4	4.2	5.5	2.5
Rosebud	10	21	7	0.15	10	9	100.0	100.0	0.0	0.0	0.0	0.0
Alaska	11	21	2	0.1	268	9	98.8	94.5	3.7	0.0	1.5	0.3
Alaska	12	19	3	0.1	20	9	100.0	100.0	0.0	0.0	0.0	0.0
Alaska	13	10	4	0.1	215	9	100.0	97.7	2.3	0.0	0.0	0.0
Total					1565		93.3	79.9	13.0	1.8	3.9	1.8

STABILITY OF BCG VACCINE

The effectiveness of BCG vaccine in increasing resistance is dependent on the number of viable bacilli. The relationship of the viability of the organism to its antigenic property and the lability of this antigenicity has been demonstrated by Smithburn and Lavin.[16] These investigators found that tubercle bacilli in a concentration of 1 mg. per ml., exposed to ultraviolet light in the range of 2537 Å for 9 min. became attenuated but remained viable and induced resistance to reinfection when injected into guinea pigs. On the other hand, cultures exposed for 10 min. to this range of light were killed and lost their immunizing properties.

One of the major drawbacks to the widespread use of BCG vaccine has been the rapid and marked decrease in the number of viable bacilli when they are suspended in different liquid menstruums. Because of this, BCG vaccine must be used within several days after it is prepared. This does not permit a determination of avirulence, tuberculogenic property, number of viable bacilli or its protective value before use.

Jensen[7] has reported a marked decrease in the virulence and number of viable bacilli after storing BCG vaccine for 2, 5, and 11 days at 2° and 18° C. Jensen attributed this decrease in virulence and viability to the presence of copper in the water used to suspend the organisms. We have investigated the bactericidal property of copper on BCG vaccine and have found that the addition of copper sulphate in a final concentration of 1 to 10,000,000 to BCG vaccine suspended in a phosphate buffer pH 7.2 had no inhibitory effect on the vaccine. The water used in making up the buffer was distilled in glass. The addition of copper sulphate in a final concentration of 1 to 100,000 increased the rate and luxuriousness of growth of the organism.

It has been our experience that BCG vaccine, prepared in a concentration of 1 mg. per ml. from 7 to 10 day old cultures on Sauton medium, shows a significant decrease in the number of viable organisms kept from 5 to 7 days at either 4° or 20° C. For this reason we recommend that BCG be used within 4 to 5 days after its preparation. When the concentration of organisms is increased to 2 or 3 mg. per ml. a larger number remain viable but a correspondingly larger number of dead bacilli are also present, which may give rise to a more severe local reaction.

The effect of age on BCG vaccine can be further demonstrated by the decrease in its tuberculogenic property. The intracutaneous injection of 0.1, 0.01 and 0.001 mg. of fresh BCG vaccine into guinea pigs gives rise to a local ulcer or tubercle, while 0.0001 mg. of the vaccine does not usually induce a demonstrable lesion. On the other hand, when the same amounts of a 10 day old vaccine are injected, a local lesion is usually obtained only with 0.1 mg. and slight or no lesion with the smaller amounts.

The number and viability of bacteria is customarily determined by inoculating varying amounts of the organisms into suitable culture mediums. Since the growth of the tubercle bacillus requires from 3 to 4 weeks' incubation, this method is impractical in standardizing the rapidly deteriorating BCG vaccine. We have therefore studied the relationship of oxygen uptake of the bacteria to their viability, realizing that a gradient exists between the fully active living cells and the dying and dead cells. The oxygen uptake of samples of BCG vaccine has been determined by means of the Barcroft-Warburg apparatus and by means of the Scholander[17] microrespirometer. Preliminary experiments, using varying quantities of heat-killed and living BCG vaccine, indicated a definite relationship between oxygen uptake and the per cent of living cells present in the mixture.

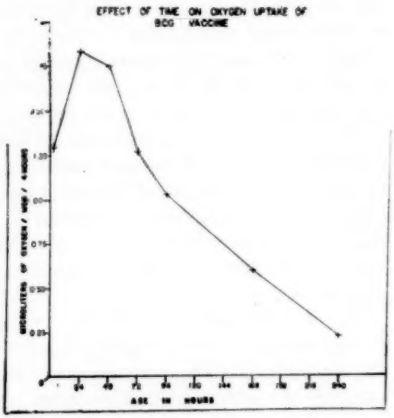
The determination of oxygen uptake

of the BCG vaccine was carried out in the Barcroft-Warburg apparatus by washing the bacteria on a sintered glass funnel and suspending them in a concentration of 50 mg., moist weight, per ml. in phosphate buffer pH 7.0, after which readings were taken at 15 min. intervals for a period of 4 hr. It was found that the oxygen uptake of the BCG vaccine decreased significantly with increasing age of the vaccine. Similar studies were conducted using the Scholander microrespirometer. The BCG vaccine in a concentration of 1 mg. per ml. was stored at 4° C. and the oxygen uptake was determined on samples of the same suspension at varying times after its preparation. The original sample was centrifuged, washed 3 times with phosphate buffer pH 7 and resuspended in fresh buffer solution in a concentration of 30 mg. per ml. Of this concentrated material, 0.066 ml. containing 2 mg. of the bacilli was transferred to a micro flask and a drop of 20 per cent potassium hydroxide was added to the small side arm. The micro flask was attached to the arm of the respirometer and the unit was kept in the water bath at 37.5° C. The oxygen uptake was determined at intervals of 30 min. for a total of 4 hr. The results of such an evaluation are presented graphically in Figure 1.

It will be observed from this chart that cell respiration as measured by its oxygen uptake decreases rapidly with increasing age of the vaccine. The results of these studies suggest the usefulness of this method for determining expeditiously the viability of the cells in the BCG vaccine.

Because of the instability of the BCG vaccine, prepared with physiological saline or phosphate buffer pH 7.2, we have investigated the usefulness of other solutions in stabilizing the vaccine. The different preparations which we have tried and the results obtained are presented in Table 3.

It will be observed that, with the exception of dextrin, none of the solutions tested was able to maintain the viability of the organisms for as long as 6 days.



Because of the instability of suspensions of BCG vaccine, the possibility of preserving the vaccine by lyophilization over anhydrous calcium sulphate was investigated. The BCG vaccine was suspended in gelatins varying in their isoelectric point, sodium ammonium pectate, certain carbohydrates, and in glutamic, malic, and succinic acids. Cultures of the vaccine made immediately after lyophilization showed a marked decrease in the number of viable organisms.

We have investigated the relative value of different culture mediums as to their ability to initiate growth with small amounts of inoculum. We have found that of the solid medium studied, the Trudeau Committee medium consisting of egg yolk, potato flour, and glycerine gave the best results. Of the liquid synthetic mediums, we have found growth appears earlier and can be initiated with a smaller amount in Youmans medium than in Dubos medium containing Tween 80.

TABLE 3

Effect of Age on Viability of BCG Vaccine Suspended in 1 Mg. per Ml. in Different Solutions

	Minimal Amount of BCG Vaccine Initiating Growth in Dubos Medium						
	Age of Vaccine						
Solution	*3 hours*	*3 days*	*6 days*	*10 days*	*12 days*	*22 days*	*25 days*
Physiological saline	10^{-7} mg.	10^{-6} mg.	10^{-2} mg.	10^{-1} mg.	10^{-1} mg.	10^{-1} mg.	No growth
Ringer solution	10^{-5} mg.	10^{-3} mg.	10^{-2} mg.	10^{-1} mg.	10^{-1} mg.	10^{-1} mg.	No growth
Phosphate buffer pH 7.2	10^{-6} mg.	10^{-6} mg.	10^{-2} mg.	10^{-2} mg.	10^{-2} mg.	10^{-1} mg.	10^{-1} mg.
Sauton medium 1:3 dilution	10^{-6} mg.	10^{-6} mg.	10^{-2} mg.	10^{-1} mg.	10^{-2} mg.	10^{-1} mg.	No growth
Thiourea 0.5%	10^{-6} mg.	10^{-4} mg.	No growth	No growth	No growth	No growth	No growth
Horse serum 10% in saline	10^{-3} mg.	10^{-3} mg.	10^{-1} mg.	10^{-1} mg.	10^{-1} mg.	10^{-1} mg.	10^{-1} mg.
Milk 10%	10^{-5} mg.	10^{-4} mg.	10^{-3} mg.	10^{-2} mg.	10^{-2} mg.	No growth	No growth
Bovine Albumin 5% (Fraction V)	10^{-7} mg.	10^{-6} mg.	10^{-2} mg.	10^{-2} mg.	10^{-1} mg.	10^{-1} mg.	10^{-1} mg.
Pectin 1.0%	10^{-7} mg.	10^{-6} mg.	10^{-3} mg.	10^{-2} mg.	10^{-2} mg.	10^{-1} mg.	10^{-1} mg.
Mannitol 1.0%	10^{-7} mg.	10^{-6} mg.	10^{-3} mg.	10^{-2} mg.	10^{-1} mg.	10^{-1} mg.	10^{-1} mg.
Dextrin 1.0%	10^{-4} mg.	10^{-3} mg.	10^{-4} mg.	10^{-2} mg.	10^{-1} mg.	10^{-1} mg.	10^{-1} mg.
Ascorbic acid 0.5%	10^{-5} mg.	10^{-7} mg.	10^{-3} mg.	10^{-2} mg.	10^{-1} mg.	No growth	No growth
Cystine, saturated solution	10^{-4} mg.	10^{-3} mg.	10^{-3} mg.	10^{-2} mg.	10^{-2} mg.	10^{-2} mg.	10^{-1} mg.
Cysteine 0.5%	10^{-5} mg.	10^{-3} mg.	10^{-3} mg.	10^{-1} mg.	10^{-1} mg.	No growth	No growth

EVALUATION OF BCG VACCINE ON BASIS OF PROTECTION

Although it is true that the administration of large amounts of tubercle bacilli, living or dead, or fractions of the tubercle bacillus, may result in the production of humoral antibodies, there is no acceptable evidence that such antibodies play any role in acquired resistance to tuberculosis. The relatively small amount of organisms administered to man in BCG vaccine is insufficient to elicit humoral antibodies, but is capable of inducing allergy as determined by means of the tuberculin reaction. The development of allergy cannot, however, be accepted as definite evidence of resistance to reinfection.

The final proof of the efficacy of an immunizing agent is its ability to protect against a challenge dose of the specific virulent infecting agent. At the present time the effectiveness of BCG vaccine is measured by its ability to induce a positive tuberculin reaction in man.

In order to estimate the protective value of BCG vaccine we have determined its effectiveness in protecting mice against a challenge dose of virulent tubercle bacilli. Mice weighing from 18 to 20 gm. were injected intraperitoneally or subcutaneously with 0.1 mg. of BCG vaccine in a volume of 0.1 per ml. One month after receiving the vaccine the mice were injected intravenously, in the most prominent caudal vein, with varying amounts of a 7 to 10 day old culture of the virulent Ravenel bovine type of tubercle bacillus grown in Dubos medium containing Tween 80. With this dose the unvaccinated animals die in from 2 to 4 weeks and at necropsy there is noted extensive confluent tuberculous bronchopneumonia. The lungs are markedly congested and edematous in those dying early, while in those dying later there are observed numerous, extensive, caseous areas. The spleen is swollen and weighs from 3 to 4 times that of the normal. Many of the BCG vaccinated mice receiving the larger challenge dose of virulent bacilli also show extensive tuberculosis of the lungs but with the smaller doses many of the BCG vaccinated animals survive and show no gross lesions of tuberculosis.

We have found that the intravenous administration of the challenge dose

gives the most uniform results. While the intranasal instillation of the virulent tubercle bacilli in partially anesthetized mice gives a high per cent of pulmonary lesions, the method involves some risk to the investigator and the results are not as uniform as are those obtained with the intravenous route. The intracerebral injection of the challenge dose gives highly irregular results, while the intraperitoneally injection of the challenge culture in Dubos medium or in mucin fails to produce pulmonary lesions. Studies are in progress to determine the optimum dose of BCG vaccine which will protect against a challenge dose of virulent tubercle bacilli, with the hope that such a method will permit the evaluation and standardization of BCG vaccine.

SUMMARY

1. While the colonial and antigenic characteristics of the BCG culture may vary, we have not observed any evidence of increased virulence.
2. Six cultures of BCG obtained from different laboratories both in the United States and abroad are uniformly avirulent, and there is no evidence that the cultivation on bile-containing medium increases the virulence of the culture.
3. The nature of the local lesions in animals following administration of the BCG culture varies with the natural resistance of the animals.
4. The persistence of the tuberculin reaction in man, following the intracutaneous injection of BCG vaccine, is not correlated with the age of the culture nor with the number of generations for which the culture has been maintained on bile-free medium.
5. The instability of the tuberculin reaction following BCG vaccination is correlated to some degree with geographical location.
6. The viability of the organisms in BCG vaccine after 5 to 7 days decreases rapidly and continues to decrease with increasing age, as indicated by cultural methods, tuberculogenic property, and oxygen consumption.
7. Lyophilization reduces immediately the number of viable organisms present in BCG vaccine.
8. Mice can be protected by BCG vaccine against a challenge dose of virulent tubercle bacilli.
9. The universal use of BCG vaccine and its manufacture by commercial organizations should depend on stabilization of the vaccine and development of standards based on protection tests with suitable animals.

NOTE—We greatfully acknowledge the technical assistance of Mrs. Mary Ann Stewart and Mr. Walter Flagg.

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Antigenic Activity of Dry Glucose BCG Vaccine*

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THE brief 10 day period of optimum antigenic activity of liquid BCG vaccine necessitates its distribution for use in man before the vaccine is properly controlled for purity, viable microörganisms, their tuberculogenic potency, and harmlessness after 3 to 6 months' passage in the guinea pig. A dry vaccine that would be stable from 6 to 12 months would solve these handicaps and make BCG vaccine accessible the world over.

Besides Leshchinskaya and Vakengut's [1, 2] original study on dry BCG glucose vaccine, a series of limited similar studies have appeared.[3-5] However, no long-term investigation is available on dry BCG vaccine's viability, tuberculogenic potency, and immunizing value against a challenge infection. The present comparative investigation consists of five successive tri-monthly series of *in vitro* and *in vivo* experiments with fresh liquid and variously aged dry BCG glucose vaccine.

EXPERIMENTAL METHODS AND DATA

Lyophilized BCG Glucose Vaccine

Preparation of Lyophilized BCG Glucose Vaccine

A sterile 10 day old BCG Sauton II culture (B-7) showing typical growth of densely coiled and cream-colored film, was transferred to a 2 cm. thick pile of filter papers in a large Petri plate and covered with a similar pile. Excessive liquid was removed by placing a 1 kg. cylindrical weight on top of the pile for 10 min. when the semidry bacterial mass was transferred on a platinum spade to a porcelain crucible covered with a lid. After the crucible and its contents were weighed, the bacterial mass was emptied into a cotton plugged 500 ml. Erlenmeyer flask which contained 1 kg. of 4 mm. wide "SKF" inoxidizable steel balls. The crucible was reweighed to determine the exact weight of BCG. The flask was rotated for 5 min. at 60 r.p.m., at which time the bacterial mass was finely divided and adhered as a thin veil to the sides of the flask and the steel balls. Ten ml. of a 50 per cent Merck glucose solution were added to the flask and rotation was continued for 5 min. The suspension appeared as a thick and homogenous oil without any coarse particles. Sufficient glucose solution was now added to make a 20 mg. BCG suspension per ml. and rotation was continued for 10 min. At this time, microscopic examination of the suspension revealed mostly freely dispersed bacilli and occasional clusters of less than 10 bacilli. Under constant rotation, portions of the BCG suspension were aspirated into a 10 ml. glass syringe, supplied with a 3½ in. long 13 gauge needle, and 1 ml. amounts were deposited directly in the bottom of 5 ml. Pyrex bulb containers which were plugged with cotton. Aseptic technic

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was used throughout all these manipulations and aerobic and anaerobic sterility tests proved subsequently sterile.

Without delay, the bulb containers were quickly frozen in a dry ice alcohol bath under constant rotation which made the bacterial suspension adhere as a thin crystalline layer to the sides of the container. The cotton plugs were removed and the containers connected to the manifold of Stokes' Miniature Lyophile Apparatus [6] with the freezing bath in place and the vacuum pump set running. Within 3 min. the pressure within the containers was less than 0.1 mm. Hg., and it remained below that point for the entire run. The freezing bath was so placed that the temperature at the level of the containers ranged from —20° C. to 0° C. Small amounts of dry ice were added periodically and slight thawing was observed in several containers during the repacking. Bubbling had stopped completely after a run of 60 hr., when the material appeared syrupy in the lower portion and as a white crystalline film along the upper portion of the containers. At this time the containers were sealed off with a gas flame. The vacuum checked satisfactorily, immediately after sealing, as well as after 24 hr. at 4° C. This lot of lyophilized BCG glucose vaccine was found to contain 2.33 per cent moisture when dried at 100° C. *in vacuo* over P_2O_5 to constant weight. This lot of dry vaccine has since been kept constantly in the icebox at 2° C. to 4° C.

Viability of BCG in Liquid and Dry Glucose Preparations

The number of viable BCG organisms in the liquid and dry vaccine preparations was determined by seeding tenfold dilutions of thoroughly homogenized suspensions in 50 ml. tubes of Löwenstein's egg medium. Although the lyophilized preparations are readily resuspended in saline or distilled water—usually it requires from 2 to 5 min. agitation to resuspend 20 mg. BCG dry glucose vaccine in 1 ml. liquid—microscopic examination reveals that much longer time is required to obtain a suspension of individual elements with occasional clusters of less than 10 bacilli. Such ideal homogenization for cultural purposes is obtained satisfactorily by passing the resuspended preparation back and forth several dozen times between the container and a 1 ml. Luer syringe supplied with a fine 26 gauge hypodermic needle. At best, one obtains only an approximate evaluation of living elements by cultural means, inasmuch as occasional clusters of bacilli will occur and these in turn may give rise to single colonies. It would appear, however, that the tendency to form clusters of BCG elements is greater in the dry glucose vaccine than in the freshly prepared liquid vaccine. It might seem inadmissible, therefore, to contend that the yield of individual BCG colonies on the Löwenstein medium seeded with resuspended dry vaccine does not contain a greater number of living elements than those represented by the actually observed colonies.

Our procedure of making cultures is as follows: One ml. from each of the 10^{-5}, 10^{-6}, and 10^{-7} dilutions of the test material is seeded in 0.1 ml. amounts in ten 50 ml. tubes of Löwenstein's egg medium in duplicate series. The cotton plugged tubes are placed in the incubator at 37.5° C. in horizontal position after being individually adjusted with cotton pads to insure that the 0.1 ml. inoculum remains evenly distributed along the surface of the medium. Complete evaporation of the liquid usually takes place within 2 to 3 hr. The tubes are then sealed with rubber caps and inverted to prevent scattering of eventual growing colonies by droplets of condensation water settling on the medium. Final reading of colonies is made 2 months later.

The original liquid preparation yielded

approximately 46 million living elements (colonies) per mg. of semidry weight, and the resuspended lyophile preparations cultured after having been preserved at 2° C. to 4° C. respectively for 3, 6, 9, and 12 months presented an almost stabilized living population of BCG varying presumably between 1,300,000 and 1,500,000 elements (colonies), or a survival rate varying between 2.83 and 3.26 per cent of the original living elements in the liquid BCG vaccine.

The cultural and biologic characteristics of BCG recovered from lyophile preparations differ in no discernible aspects from those observed in the original pre-lyophile culture. BCG colonies recovered from the 3 to 12 month old lyophile preparations, when transferred from the Löwenstein egg medium to glycerine-potato medium, continue to grow typically along the surface of the potato and as a film across the liquid portion. Transplants of the film to Sauton medium present identical growth curves with those of fresh cultures and the antigenic properties seem likewise undisturbed. A separate paper will be presented on these aspects of the lyophilized BCG cultures.

ANTIGENICITY OF PRE-LYOPHILE AND LYOPHILE BCG VACCINE

Intracutaneous and Transcutaneous Skin Lesions

One criterion of BCG's antigenicity — used regularly in our standardization of every weekly lot of vaccine[7] — is the production of intracutaneous and transcutaneous skin lesions with graded doses of the vaccine. The following procedure was followed to assess the tuberculogenic potency of the pre-lyophile vaccine and the lyophile preparations preserved respectively for 3, 6, 9, and 12 months in the icebox: each lot was tested in 6 white albino guinea pigs, weighing between 300 and 350 gm., and reacting negatively with 10 mg. Old Tuberculin injected intracutaneously. The skin of the abdomen and left side of the body was epilated with electric clippers and washed with alcohol and ether. Intracutaneous injections of 0.1 ml. saline suspensions of the vaccine containing 0.1 mg., 0.01 mg., 0.001 mg., and 0.0001 mg. BCG were made in the 4 quadrants of the abdomen. Care was taken to inject the vaccine as superficially as possible, so that a white bleb remained visible for about 5 min. Two or 3 drops of the 20 mg./ml. vaccine were spread evenly across the epilated skin on the left side of the body. Holding the skin taut, 40 punctures, approximately 2 to 3 mm. in depth, were made through the skin with our automatic, spring actuated, multiple puncture vaccination apparatus.[8] The skin was stretched slightly in order to verify the presence of petechial bleeding from each of the punctures. One or two drops of vaccine were spread across the punctured area. Readings were made in 1 and 3 weeks after inoculation, when the maximum intracutaneous and transcutaneous lesions had developed. Typical vaccination nodules with suppurating centers are produced regularly with 0.01 mg. of freshly prepared vaccine and only a hardened nodule with 0.001 mg., while no macroscopic lesion is produced with 0.0001 mg. of BCG vaccine. The multiple puncture sites usually present from 1 to 1.8 mm. wide red papules after 1 week, and these measure from 2 to 3 mm. in width and from 1 to 2 mm. in height after 3 weeks. Desquamation and healing take place after 4 weeks and the process is completed 3 to 4 weeks later. Suppuration in individual papules is exceedingly rare.

The difference between the intracutaneous and transcutaneous skin lesions produced by the pre-lyophile and lyophile vaccine was solely of a quantitative character. The lesions produced by every lot of lyophile vaccine were decidedly less intense and extensive than

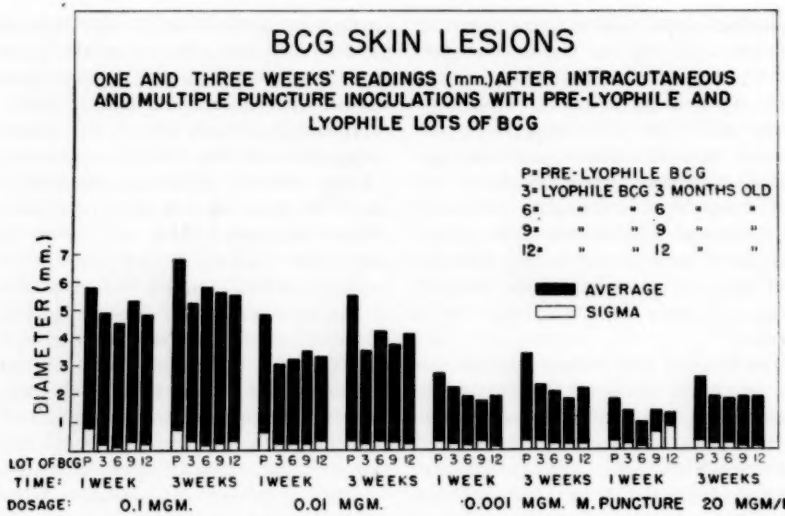
BCG SKIN LESIONS
ONE AND THREE WEEKS' READINGS (mm.)AFTER INTRACUTANEOUS AND MULTIPLE PUNCTURE INOCULATIONS WITH PRE-LYOPHILE AND LYOPHILE LOTS OF BCG
P=PRE-LYOPHILE BCG
3=LYOPHILE BCG 3 MONTHS OLD
6= " " 6 " "
9= " " 9 " "
12= " " 12 " "
AVERAGE
SIGMA
DIAMETER (mm.)
LOT OF BCG P 3 6 9 12
TIME: 1 WEEK 3 WEEKS
DOSAGE: 0.1 MGM. 0.01 MGM. 0.001 MGM. M. PUNCTURE 20 MGM/ML

CHART 1—BCG pre-lyophile and lyophile vaccine skin lesions.

those caused by the pre-lyophile vaccine. Chart 1 presents the data on the lesions observed in 1 and 3 weeks after inoculation. These data have been analyzed statistically to detect significant deviations in the tuberculogenic potency of fresh and dry lots of vaccine. It is noted that, as soon as 1 week after inoculation, the skin lesions caused by every lot of dry vaccine differ significantly from those produced by the fresh vaccine with 0.01 mg. and 20 mg./ml. BCG. After 3 weeks these differences become significant with all the dosages of BCG used. It is apparent therefore that the loss of tuberculogenic potency is considerable in every lot of lyophile vaccine having been preserved up to 1 year in

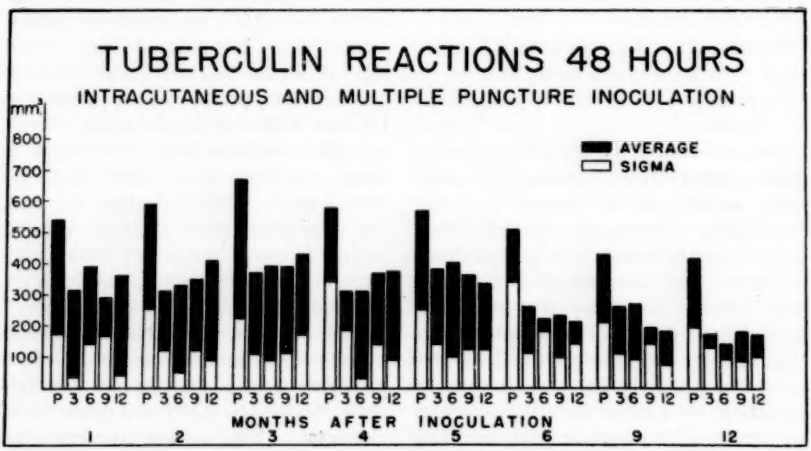

CHART 2—Tuberculin reactions following intracutaneous and multiple puncture inoculation with graded doses of pre-lyophile and lyophile vaccine.

the icebox. The difference in tuberculogenic potency of fresh and dry vaccine is doubtless referable to the enormous reduction of living elements during the freeze-drying process, inasmuch as the presence of dead elements is approximately equal in every lot of dry vaccine.

Tuberculin Sensitivity Produced by Pre-lyophile and Lyophile Vaccine

Another criterion of BCG's antigenicity is its ability to render the organism tuberculin-positive. This allergy is measurable both in terms of intensity of local induration and the duration of the state of allergy. For this purpose we have used the same 5 groups of animals in which the skin lesions were discussed above. For 12 months, monthly intracutaneous injections with 10 mg. O.T. were performed and reading of reactions was made 48 hr. later. The area of induration (not erythema) was measured crosswise and its thickness was measured by folding the indurated skin between caliper prongs. An approximate volumetric measure was obtained by multiplying half the thickness by the two crosswise diameters, e.g., 2 x 10 x 10 mm. = 200 mm.^{3} These measurements are presented in Chart 2. One month after the intracutaneous inoculation with 0.1 mg., 0.01 mg., 0.001 mg., and 0.0001 mg. BCG and 40 punctures with 20 mg./ml. BCG, the 540 sigma 168.3 mm.^{3} intensity of tuberculin hypersensitivity produced by the pre-lyophile vaccine differed significantly from the degree of allergy observed in any of the groups inoculated with 3, 6, 9, and 12 month old lyophile vaccine which respectively produced 315, 385, 286, and 361 mm.^{3} induration. The intensity of induration in the pre-lyophile group is approximately one-third greater than in the lyophile groups. This proportion held true during the entire period of observation and, except on four occasions —in the second, fourth (twice), and fifth months after inoculation — the differences in intensity of tuberculin hypersensitiveness between the pre-lyophile and lyophile groups of animals were significantly greater in the fresh vaccine group. It is apparent, however, that the peak of maximum tuberculin allergy occurred simultaneously in all the animal groups 5 months after inoculation. One year after inoculation the degree of allergy had dropped to one-half of its intensity at 5 months in the lyophile groups, while it still remained four-fifths of its intensity at 5 months in the pre-lyophile group. Thus there seems to exist a definite relationship between the tuberculogenic activity and production of tuberculin sensitivity of the freshly prepared and the dry vaccine lots, and that the latter is less effective in both aspects than the former.

Protective Value of Pre-lyophile and Lyophile Vaccine Against a Challenge Infection

A third criterion of BCG's antigenicity is its protection against a challenge infection with virulent tubercle bacilli. For this purpose, 5 groups of normal guinea pigs, reacting negatively with 10 mg. O.T. and each comprising twelve animals weighing between 300 and 400 gm., were successively injected subcutaneously in the right hind leg with 10 mg. of pre-lyophile or 3, 6, 9, and 12 month lyophilized BCG vaccine. Within a few weeks the adjacent inguinal lymph nodes became palpable and a fluctuating abscess developed. This abscess rarely fistulated during the first 3 months after inoculation. Its volume was quite variable in different animals inoculated with the same vaccine and in extreme instances measured above 15 ml. as late as 7 months after inoculation. We shall later discuss the measurements of these inoculation abscesses under autopsy findings. The immunization process produced no malaise nor loss in individual growth curves during the first 3

months after inoculation in any one of the 5 groups of animals.

Tuberculin tests were performed at monthly intervals with 10 mg. O.T. on all vaccinated animals. During the first 3 months after vaccination, with either the pre-lyophile or the variously aged lyophile lots of BCG vaccine, it was noted that the degree of tuberculin hypersensitiveness is greater in the group inoculated with the pre-lyophile vaccine than in any of the lyophile vaccine groups; also, the allergy is more intense in all the groups vaccinated with 10 mg. BCG than in those animals that received 0.1 mg., 0.01 mg., 0.001 mg., and 0.0001 mg. BCG intracutaneously and 40 punctures with 20 mg./ml. BCG.

Exactly 3 months after vaccination with 10 mg. of pre-lyophile or any one of the 4 lots of lyophile BCG vaccine, all the immunized animals and an equal number of non-immunized, tuberculin-negative guinea pigs of approximately the same weight, were inoculated subcutaneously in the right hind leg with 0.0001 mg. semidry weight of a 1 month old Löwenstein egg medium culture of a virulent strain of human tubercle bacilli (No. 33246). Since this virulent inoculation took place at 3 month intervals, the population of living virulent tubercle bacilli contained in the 0.0001 mg. semidry weight of 5 different cultures varied slightly. Hence the pre-lyophile group with controls received 1,283 living tubercle bacilli, the 3 month old lyophile vaccine group with controls, 1,171 bacilli, the 6 month old, 9 month old, and 12 month old lyophile vaccine groups with controls respectively, 1,450, 1,931, and 1,533 living and virulent human tubercle bacilli.

It was noted that in every instance of

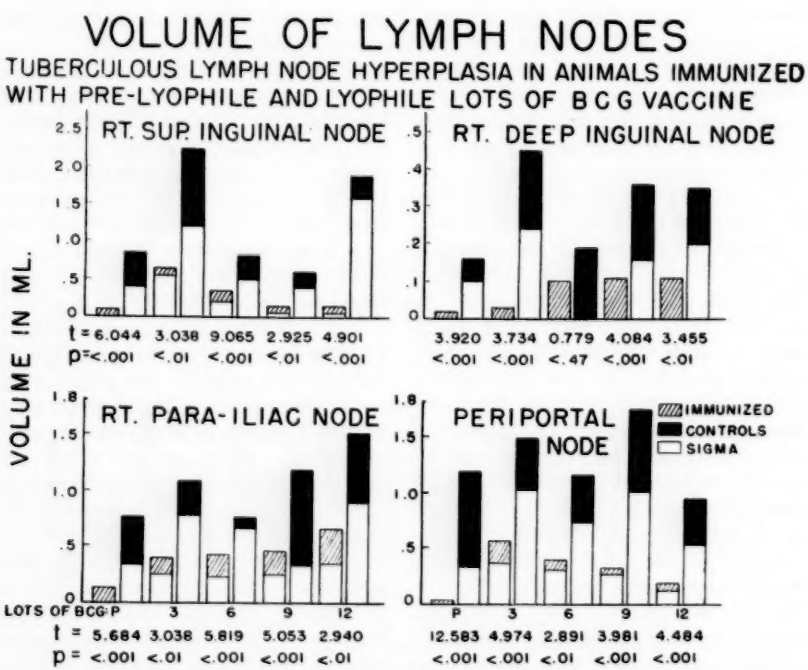
VOLUME OF LYMPH NODES
TUBERCULOUS LYMPH NODE HYPERPLASIA IN ANIMALS IMMUNIZED WITH PRE-LYOPHILE AND LYOPHILE LOTS OF BCG VACCINE
VOLUME IN ML.
RT. SUP. INGUINAL NODE
t = 6.044 3.038 9.065 2.925 4.901
p = <.001 <.01 <.001 <.01 <.001
RT. DEEP INGUINAL NODE
3.920 3.734 0.779 4.084 3.455
<.001 <.001 <.47 <.001 <.01
RT. PARA-ILIAC NODE
PERIPORTAL NODE
IMMUNIZED
CONTROLS
SIGMA
LOTS OF BCG P 3 6 9 12
t = 5.684 3.038 5.819 5.053 2.940
p = <.001 <.01 <.001 <.001 <.01
P 3 6 9 12
12.583 4.974 2.891 3.981 4.484
<.001 <.001 <.01 <.001 <.001

CHART 3—Volume of lymph nodes in immunized and control animals.

post-infection tuberculin-reaction data, the infinitesimally smaller dose of virulent living elements was capable of producing a higher degree of tuberculin hypersensitiveness in the control animals than in those immunized previously with either freshly prepared or variously aged lots of dried BCG vaccine. These differences in degree of allergy showed 100 per cent efficiency during the first post-infection month and 60 per cent respectively during the second and third post-infection months. Whether or not this delayed process of tuberculin hypersensitiveness in the immunized animals infected with a virulent infection is due to a synchronous delay in the spread and multiplication of virulent tubercle bacilli in the tissues is a question that should be answered by a quantitative study of the viscera from the variously immunized animals and their controls. While the body weight of the variously immunized animals in no instance differed significantly from that of their controls during the first and second post-infection months, a marked difference in weights took place before the animals came to autopsy, when the immunized groups presented nearly 80 per cent significant deviations in body weight from that of their controls.

Mortality Rate of Immunized and Control Animals

Among the control animals to the pre-lyophile, 3, 6, 9, and 12 month old lyophile vaccine group animals, the mortality rate from generalized tuberculosis was respectively 67, 50, 58, 42, and 58 per cent between 95 and 155 days after the virulent inoculation. Among the immunized animal groups, only 1 animal died in the 9 month old lyophile vaccine group (8 per cent) 98 days after the virulent inoculation. All the surviving

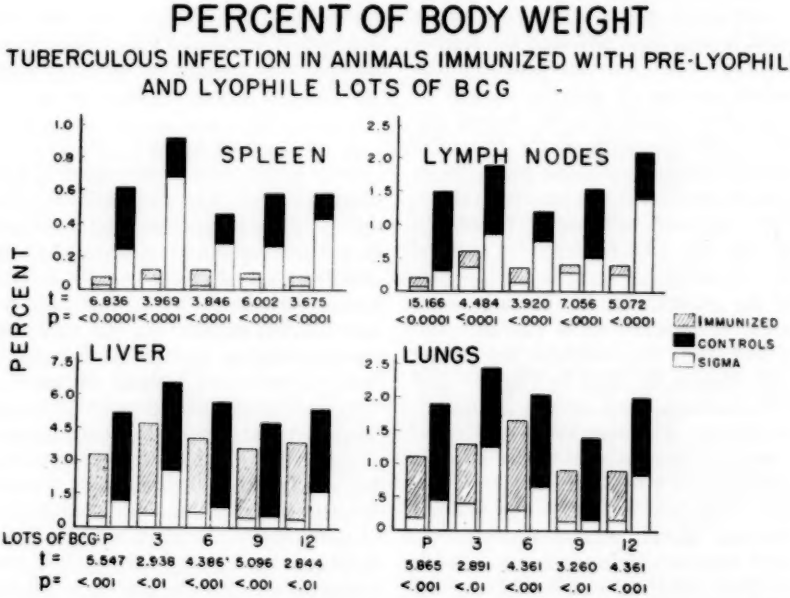
PERCENT OF BODY WEIGHT
TUBERCULOUS INFECTION IN ANIMALS IMMUNIZED WITH PRE-LYOPHILE AND LYOPHILE LOTS OF BCG
PERCENT
SPLEEN
t = 6.836 3.969 3.846 6.002 3.675
p = <0.0001 <.0001 <.0001 <.0001 <.0001
LYMPH NODES
t = 15.166 4.484 3.920 7.056 5.072
p = <0.0001 <.0001 <.0001 <.0001 <.0001
IMMUNIZED
CONTROLS
SIGMA
LIVER
LOTS OF BCG P 3 6 9 12
t = 5.547 2.938 4.386 5.096 2.644
p = <.001 <.01 <.001 <.001 <.01
LUNGS
P 3 6 9 12
t = 5.865 2.891 4.361 3.260 4.361
p = <.001 <.01 <.001 <.01 <.001

CHART 4—Weights in per cent of body weight of lymph nodes, spleen, liver, and lungs from immunized and control animals.

animals were killed for comparative study 106 to 155 days after the virulent inoculation.

It is apparent, therefore, that no marked difference in survival rate exists between any one of the immunized groups, but that the protective value of the lyophile vaccine against a challenge infection is considerable, but less than the resistance produced by the fresh liquid vaccine.

QUANTITATIVE ANALYSIS OF DELAYED TUBERCULOUS HYPERPLASIA

As on previous occasions,[9, 10] the same autopsy procedure was adhered to, namely, volumetric measurements of 14 lymph nodes and the spleen, liver, and lungs; actual weight of total lymph nodes (pooled), the spleen, liver, and lungs; conversion of these weights into percentage of the animal's body weight. The completed data were tested for significance by Fisher's [11] method for comparison of two means (Charts 3 and 4).

From these exhaustive calculations it would appear that, although the freshly prepared BCG vaccine produces the highest scoring of delayed spread of tuberculous infection in the guinea pig, the immunizing value of the dry BCG vaccine preserved up to one year after its preparation is not lagging far behind. With improved methods of freeze-drying, one may hope for a greater survival rate of living elements to compensate for the quantitative lag in antigenicity of the freeze-dried BCG vaccine. Our present study thus confirms the pioneer work done in this field by Glover [12] and Leshchinskaya,[2] and recently by Bretey, van Deinse, and Senechal [3] and Ungar.[4]

Seventy persons who had a negative reaction with 1 mg. O.T. and 0.005 mg. PPD were vaccinated by the multiple puncture technic with 1 year old dry BCG vaccine which was resuspended in distilled water to contain 20 mg./ml. BCG. Typical vaccination papules developed in only 56 persons (80 per cent). The skin lesions seemed in general to be less intense than those produced by fresh liquid vaccine. The tuberculin tests were repeated 8 to 10 weeks after vaccination. Among the 56 persons having shown vaccination papules, 49 (87.5 per cent) reacted positive with 1 mg. O.T. (715 ± 81.18 mm.^{3} induration) and 43 persons (76.8 per cent) with 0.005 mg. PPD (631 ± 49.43 mm.^{3} induration). This discrepancy between O.T. and PPD reactions in BCG vaccinated persons is not unusual in our experience. In this small series, the rate and degree of tuberculin sensitivity caused by the dry BCG vaccine are apparently less than those observed with fresh liquid vaccine. This impression was strengthened 6 months later when the same doses of O.T. and PPD were repeated in 48 of the 56 persons having shown vaccination papules. At this time 44 persons (92 per cent) presented 947 ± 39.16 mm.^{3} induration with 1 mg. O.T. and 37 persons (77 per cent) showed only 319 ± 23.14 mm.^{3} induration with 0.005 mg. PPD. The study of BCG dry vaccine in man is being continued on a larger scale.

DISCUSSION

Our study with freeze-dried BCG vaccine has clearly demonstrated the ability of such a preparation to retain its antigenicity under adverse physical conditions for at least 1 year. It also proves that, in spite of its greatly reduced living population, the surviving organisms retain their original morphologic, cultural, and biologic characteristics. It is reasonable, therefore, to suppose that the observed lower antigenicity of dry vaccine, as demonstrated by smaller skin lesions with graded doses of vaccine, the diminished degree of tuberculin sensitivity, and the lower resistance against a challenge infection with virulent tubercle bacilli, is mainly due to the proportional lower content of living elements in the dry vaccine than

in the freshly prepared liquid vaccine. It is regrettable that parallel studies were not carried out simultaneously with dry vaccine containing the same living population of BCG as fresh liquid vaccine in order to prove or disprove our contention that the essential difference between dry and liquid vaccine is quantitative rather than qualitative. Such parallel studies are in progress. It is apparent, however, that with proper adjustment of the dosage of living elements in resuspended dry vaccine, identical antigenic reactions can be obtained with those displayed by freshly prepared liquid vaccine.

This consideration brings up a pertinent question: how many live organisms should be present in dry BCG vaccine to make it usable? With our standardized technic of vaccine production,[7] the usual run of living elements in weekly lots of vaccine is approximately 35 million BCG per mg. of semidry Sauton medium 10 to 11 day old cultures. The dry vaccine preparation used in this study contained 1½ million living elements per mg. of original culture. In spite of the frequency of ulceration and abscess production which hampers the widely practised intracutaneous inoculation method of BCG vaccination, its advantage over scarification and multiple puncture methods is that a more or less exact dosage of BCG is deposited under the skin. The universally employed intracutaneous dosage varies between 0.05 mg. and 0.1 mg. BCG. In our laboratory this dosage contains, therefore, on the average of 1,750,000 and 3,500,000 living elements. Such single inoculation is capable of producing a conversion rate of tuberculin-positive reactions in almost 95 per cent of vaccinated children and adults within 8 weeks after vaccination. Although some of these positive reactors may become tuberculin-negative a year or so later, the average duration of the allergy produced by one single inoculation with BCG is about 5 years. If the attempt should ever be made to substitute dry and already rigidly controlled BCG vaccine for freshly prepared and imperfectly controlled liquid BCG vaccine by adjusting the dosage of dry vaccine for intracutaneous use in man, one should have equalized its living population with that contained in freshly prepared vaccine. And yet, the dry vaccine would contain a dominating portion of killed elements which in turn will boost the antigenic impact of the vaccine. Although we prefer freshly prepared BCG vaccine produced under rigid laboratory control, we can readily visualize a great field of usefulness for dry vaccine in parts of the world shut off from a steady supply of fresh liquid vaccine. The problem is to devise means by which the dry vaccine will retain all the antigenic constituents of fresh vaccine and this may perhaps be achieved by deep-freezing the freshly prepared liquid vaccine without resorting to the adverse physical conditions imposed on the bacterial cell by the freeze-drying process.

CONCLUSIONS

1. Dry BCG glucose vaccine sustains a considerable loss of living elements during the freeze-drying process, but its viability remains unchanged for more than one year when stored at 2° C. to 4° C.
2. The morphologic, cultural, and biologic characteristics of dry BCG remain unaltered after the freeze-drying process.
3. The antigenicity of dry BCG vaccine is quantitatively, but not qualitatively, lower than that of fresh liquid vaccine as demonstrated by skin lesions produced with graded doses of vaccine, tuberculin sensitivity, and resistance against a challenge infection with virulent tubercle bacilli.
4. Dry BCG glucose vaccine is capable of producing typical skin lesions and tuberculin sensitivity in man, but of less intensity than that produced by fresh liquid vaccine.
5. Although quantitatively inferior to fresh liquid vaccine in living organisms, dry BCG vaccine has the distinct advantage over fresh liquid vaccine of retaining its antigenic activity over long periods while desirable tests are being completed for its purity, harmless-

ness, and antigenic potency before its use in man.

6. With adequate adjustment of dosage with reference to living organisms, dry BCG vaccine should prove useful in localities having no access to fresh liquid vaccine.

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Military Government Public Health Workers Organize

An interim committee, formed at the time of the 1949 Annual Meeting of A.P.H.A., is developing an organization of officers and enlisted personnel who served in public health activities of military government during World War II. Its chairman is Col. Harold R. Hennessy, Chicago, and, interim secretary, Col. John T. Morrison, M. C. Both officers had extensive service in this field during the last war.

The committee was chosen to:

1. Arrange for a meeting at the time of the 1950 A.P.H.A. meeting in St. Louis to discuss plans for a formal organization.
2. Prepare a provisional constitution and by-laws.
3. Prepare a list of qualified personnel who could become "Founding Members."

Those interested should send a letter of application to the interim secretary (Riverside Avenue, St. Albans, West Virginia) containing full name, address and former civil affairs or military government assignment, as well as a statement indicating whether it will be possible to attend a meeting during the A.P.H.A. 1950 Annual Meeting. Self-addressed, stamped envelope should accompany each letter.

Expectancy for Outbreaks of Poliomyelitis in Camps and Schools*

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WHEN a case of poliomyelitis occurs in a camp or a school the physician in charge is confronted with a number of perplexing problems, and several urgent decisions. Is it likely that additional cases will occur, and if so, how many and when? Should the school or camp continue to operate? If it closes, will the dispersed group constitute a significant health hazard to other communities?

Since the decision in such matters depends more upon opinion than demonstrable knowledge, a study is presented of the actual behavior of poliomyelitis as it occurs during the summer season in camps and during the rest of the year in boarding schools. The objective is to see if the epidemiologic data may point the way to logical administrative control. An appraisal of the risk of acquiring clinically recognizable disease and knowledge about the probable extent of spread is of practical concern to the physician in charge of a camp or school—both in professional management of the situation and in allaying the unreasoned fear which inevitably accompanies the appearance of poliomyelitis.

Two sources of information concerning the occurrence of poliomyelitis in schools and camps were used. One was the data obtained by a questionnaire answered by heads of 140 boys' and girls' camps † in New England, and by physicians responsible for the health of 40 representative boarding schools in northeastern United States. The completed form showed how many times poliomyelitis had appeared and the dates of onset of all cases of the disease occurring in the camp or school since 1935. Second, by letter, telephone call, or visit, this information was cross-checked and further extended through the records of the 6 state health departments in New England. The reliability of clinical diagnoses is good, since most outbreaks were investigated by health officers, as well as clinicians, and most patients had the advantage of hospital study. Five doubtful instances of nonparalytic poliomyelitis reported by one camp, but not confirmed through health department records, are excluded from this analysis.

EPIDEMIOLOGIC DATA

During the 14 years from 1935 through 1948, poliomyelitis occurred in 30 (21 per cent) of these 140 camps and in 12 (30 per cent) of these 40 boarding schools. Two camps and 2 schools reported that the disease had appeared twice. Infection was usually limited to a single recognized case as shown in Table 1.

No poliomyelitis was reported among

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-seventh Annual Meeting in New York, N. Y., October 28, 1949.

† This survey was conducted with the cooperation of the New England section of the American Camping Association. Inquiries were made of 268 camps.

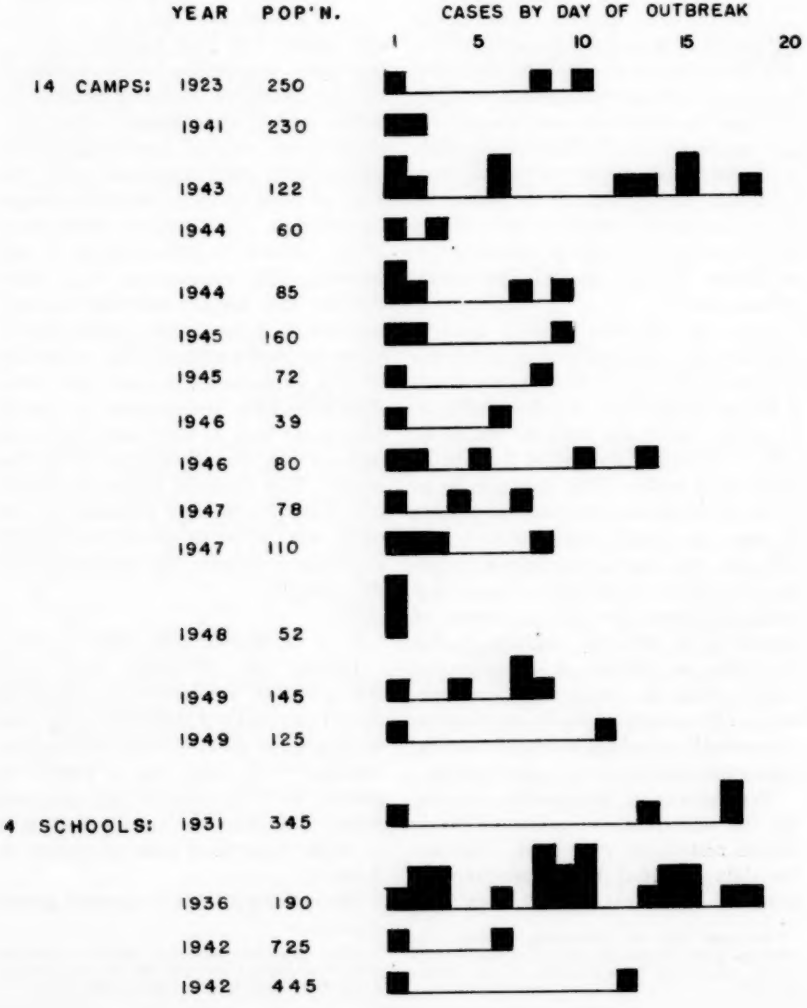
TABLE 1

Poliomyelitis in 140 Camps and 40 Schools Northeastern United States, 1935 Through 1948

	No. Experiencing Attacks	*Single-Case Outbreaks*	*Multiple-Case Outbreaks*	*Total Outbreaks*
Camps	30	21	11	32
Schools	12	11	3	14

campers in 110 (79 per cent) of the camps with annual enrollments averaging 94 boys or girls. Twenty-one, with an average attendance of 115, reported single-case outbreaks in those same 14 years; and 11, with an average enrollment of 99 campers, had multiple-case

FIGURE 1—18 Multiple-Case Outbreaks of Poliomyelitis, 1923–1949.



outbreaks. The fact that only 11 multiple-case outbreaks were observed among the 140 camps during nearly 2,000 summers of operation gives some indication of the rarity with which group infection is clinically manifest.

The experience of the 40 boarding schools surveyed covered the same period, between 1935 and 1948. Twenty-eight, with an average population of 309 students, reported no case of poliomyelitis among students during the whole 14 years. Ten schools, with an average enrollment of 339, had experienced 11 single-case outbreaks. During a total of 560 academic years of operation, multiple-case outbreaks of poliomyelitis were seen on only 3 occasions. These multiple cases arranged by day of outbreak are shown with the camp data in Figure 1.

In order to augment data on patterns of spread, 4 additional outbreaks are included in Figure 1, 1 in a camp during 1923, another in a school during 1931, and 2 camp outbreaks which occurred during the summer of 1949. The complete experience for 1949 has not yet been collected and analyzed. Information at our disposal suggests that the incidence of poliomyelitis in camps during the summer of 1949 surpassed that of any year for which we have data. One multiple-case outbreak is known to have occurred at one of the 40 schools during October, 1949.

The largest camp epidemic occurred in 1943, a year of high prevalence, and involved 10 (8.2 per cent) of 122 boys. The most extensive school outbreak occurred in 1936, a year of low prevalence. Five cases developing within the space of three days initiated a chain of infections involving 21 (11 per cent) of 190 boys. This outbreak alone accounted for more than half of all the cases contributed by 40 schools during the 14 years of observation.

A comparison of the incidence of poliomyelitis in the schools and camps surveyed with that of a regional (Massachusetts) population during the present decade is shown in Table 2. During the 9 years, from 1940 through 1948, camp cases averaged about 7 per two months summer period, and school cases a little more than 1 per academic year. Considering that the camp population surveyed was reported as 13,480, and the school population 12,315 children of susceptible age, average case rates for the 9 year period may be figured as 0.56 per 1,000 campers per summer and 0.13 per 1,000 students per academic year. Using population data* for Massachusetts from the U. S. Bureau of the Census for 1940,[1] and the average number of cases of poliomyelitis 10–14 years of age reported to the Massachusetts Department of Public Health during the same years,[2] the case rate for children of approximately camp or school age is 0.67 per 1,000 for the period from July through August, and 0.13 per 1,000 for the rest of the year. Thus, the risk of poliomyelitis in the camp and school is seen to be almost precisely that of the general population.

Analysis of the yearly incidence of poliomyelitis in camps (Table 2) suggests some relationship to regional (Massachusetts) incidence. High years corresponded in general to high years, and low years to low years for the area. School cases are too few to warrant similar comparison, but the total school experience does show that a large outbreak of poliomyelitis may occur unpredictably in an isolated segment of the population in the off-season of a year of low prevalence. This is demonstrated by the large school epidemic shown in Figure 1. Twenty-one of 190 boys developed clinical disease in the month of May, 1936, while during the entire year only 11 cases of poliomyelitis were reported among some 350,000 other children aged 10–14 residing in the state.

* 353,987 children ages 10 14.

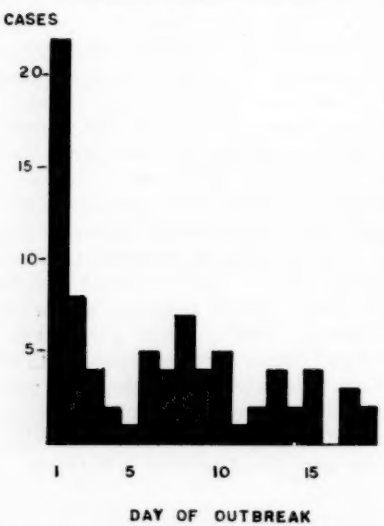
TABLE 2

Incidence of Poliomyelitis, Northeastern United States, 1940–1948
140 Camps and 40 Schools and General Population Aged 10–14

Year	Camps July–August	Schools October–June	General Population Aged 10–14 July–August	General Population Aged 10–14 October–June
1940	0	0	3	12
1941	4	0	10	31
1942	0	4	2	5
1943	10	0	10	44
1944	10	1	56	87
1945	11	4	49	96
1946	14	4	32	55
1947	9	1	33	55
1948	4	1	23	18
Total	62	15	218	403
Average	6.88	1.66	24.22	44.66
Rate/1000 Children	0.51 per 2 months	0.13 per 10 months	0.67 per 2 months	0.15 per 10 months

Certain epidemiologic features, which are not evident in the pattern of any one outbreak, emerge from the collective experience of all the camps and schools. The patterns observed for 18 multiple-case outbreaks involving 80 children have been shown in Figure 1. If the 80 recognized cases are aggregated by day of outbreak as shown in Figure 2, two main concentrations are observed. One is clustered for the most part in the first 3 days of an outbreak; the other concentration is distributed according to a curve (possibly two curves) with the peak a week after the occurrence of the first case. There is little doubt that all cases developing poliomyelitis on the first day of an outbreak in one of these closed communities ordinarily contracted the disease from common exposure. Likewise, children who develop the disease within a day or two of the first case may be reasonably considered instances of simultaneously developing infection. Judging from the distribution of cases shown in Figure 2, we make the inference that cases developing within the first 5 days of an outbreak are usually of common source origin, while the others represent secondary attacks among contacts of the initial aggregation. Actual infection of these secondary cases presumably takes place one or more days before primary or other common source cases are recognized and isolated.

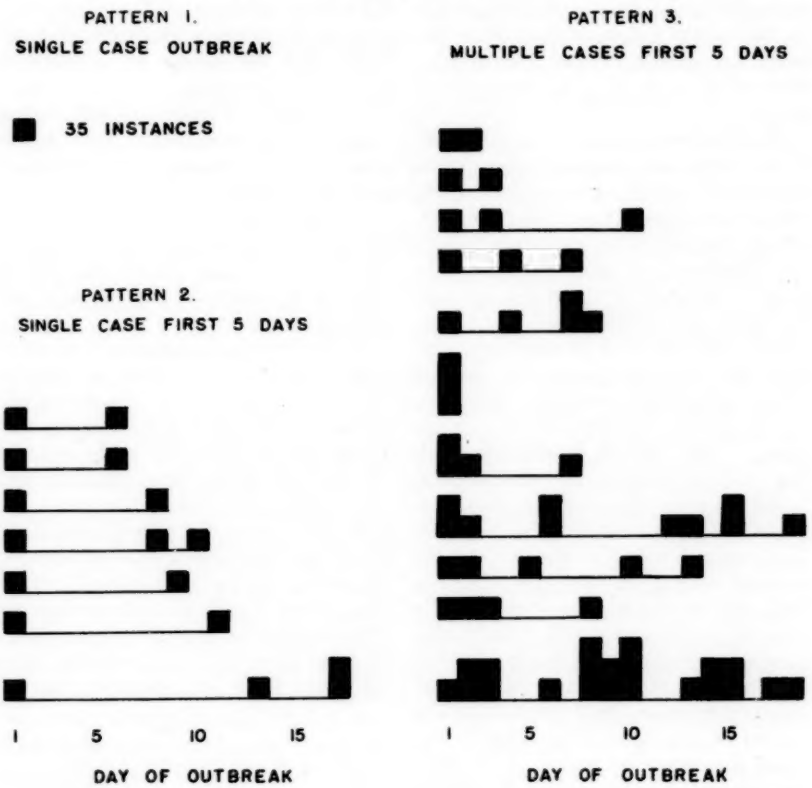
FIGURE 2—80 Multiple Cases of Poliomyelitis Aggregated by Day of Outbreaks in 14 Camps and 4 Schools, 1923–1949.



DISCUSSION

This overall pattern for the distribution of multiple cases of poliomyelitis in schools and camps conforms to the pattern of family infection demonstrated by

FIGURE 3—Patterns of Single and Multiple-Case Outbreaks of Poliomyelitis in 140 Camps and 40 Schools, 1923–1949.



Aycock and Eaton in 1925.[2] They observed that the majority (80 per cent) of multiple-cases of poliomyelitis developing within 253 families show a distribution characteristic of common source infections, and that the minority (20 per cent) are secondary attacks. In our material, 46 per cent of the cases developed during the first 5 days of an outbreak, and are interpreted as components of common source waves initiating most of the multiple-case outbreaks shown in Figure 3. This recapitulates all of our material.

Three patterns of infection are recognized, single-case outbreaks which did not progress, single-case outbreaks which were followed by 1 to 3 additional clinical cases after an interval of 5 days, and outbreaks of multiple initial cases in the first 5 days followed by as many as 16 cases during the subsequent 2 to 3 week period. The distinctive fact emerging from these data is the failure of poliomyelitis to propagate in a clinically manifest form in the large majority of occasions when a single recognized case presumably exposed the group. In the 7 single-case outbreaks which were followed by recognizable infections after an interval of 5 days the incidence of secondary attacks did not exceed more

than 1 per cent of the group exposed. On the other hand, almost half of the outbreaks initiated by multiple-cases occurring within 5 days of each other resulted in secondary cases constituting from 2 to 8 per cent of the exposed group.

The data permit a provisional estimate of the likelihood of spread when poliomyelitis is introduced into closed community groups. If but 1 case develops during the first 5 days of an outbreak, the likelihood of significant spread is small. On over 80 per cent of such occasions no further cases are anticipated. One or two more additional clinical cases may be expected in perhaps 20 per cent of such outbreaks. Epidemic spread under such circumstances is unusual. The outlook is different with the outbreak initiated by multiple cases which indicate that common source infection of several members of the group has occurred. In 3 of the 5 outbreaks ushered in by 2 common source cases at least one other individual developed infection; while in 5 of the 6 outbreaks, starting with 3 or more cases, spread of the infection occurred and reached epidemic proportions on 2 occasions. The extent of such spread was generally related to community dosage of the virus as measured by the number of common source cases developing in the first 3 or 4 days of the outbreak.

SUMMARY AND CONCLUSIONS

1. Observations are made concerning the spread of poliomyelitis among children on 46 occasions from 1935 through 1948 when the disease was introduced into camps or schools.

2. In 32 of 36 instances, with only a single case recognized during the first 5 days of the outbreak, no secondary spread occurred.

3. When the outbreak started with recognition of not one but a wave of two or more cases during the first 5 days of the outbreak, spread occurred on 7 of 10 occasions.

4. Following the appearance of poliomyelitis in a camp or school, the number of cases developing simultaneously within the first 3 or 4 days of the outbreak may be taken as a useful prognostic index of the likelihood of subsequent cases within the group.

5. The prevalence of poliomyelitis in camps and boarding schools corresponds in general to that of boys and girls of the general population. Under existing circumstances a multiple-case outbreak is to be expected in the ordinary camp or school about once every century.

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Fly Control Techniques*

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FLY control has come of age. In certain sections of the country, it may now be regarded as a legitimate function of health departments in the control of dysentery and diarrheal diseases, as has recently been demonstrated in Hidalgo County, Texas, by Watt and Lindsay.[1]

For many years, flies had been regarded as potential vectors of many common diseases. Laboratory experiments had shown that transmission of disease by flies was possible, and pathogenic organisms had been recovered from many species of common flies which had become naturally infected. In addition to laboratory experiments, many field observations, particularly on military maneuvers, had pointed out increased rates of diarrheal infection during periods of high fly density. The actual transmission of disease by flies lacked confirmation, however, because it was impossible to prove the relative significance of other modes of transmission.

With the demonstrated effectiveness of DDT in controlling flies, the Communicable Disease Center of the Public Health Service undertook the study of the role of flies in the transmission of disease in civilian populations. Hidalgo County presented an excellent opportunity for such a study because of its high rate of infection with diarrheal diseases and its high fly prevalence. Nine small cities in the county were selected and divided into two groups. One group was subjected to chemical fly control measures while the other group remained untreated.

In those communities where fly control measures were in force, a significant reduction in the mortality, morbidity, and infection from diarrheal diseases was obtained. At the conclusion of their two year experiment, Watt and Lindsay reversed their treated and untreated cities and completely reversed the epidemiological trends. The work in Hidalgo County may be considered as reasonably adequate proof that in areas where disease organisms are readily accessible to flies and fly populations are very heavy, *transmission of disease by flies actually occurs in nature.*

Investigation of the role of flies in the transmission of other diseases is being conducted by the Communicable Disease Center but the cost involved in reducing flies to a very low level is a retardant factor in these studies.

It was once thought that DDT would provide the solution for large-scale experiments of this type but flaws in this line of reasoning were made apparent in Hidalgo County. It was found that indoor applications of DDT residuals had little effect on the total fly populations. Furthermore, flies were not killed quickly enough to prevent possible transfer of disease organisms. When out-of-door applications of DDT residuals were made, it was found that the treated surfaces became ineffective in a relatively short

* Presented before the Inter-American Association of Sanitary Engineering and the Engineering Section of the American Public Health Association at the Seventy-seventh Annual Meeting in New York, N. Y., October 27, 1949.

period, sometimes as short as one week.

Based on the necessity of returning to certain areas as frequently as once each week, insecticidal procedures were adjusted to include the application of DDT space sprays over extensive areas. Though expensive, it has been shown that the combination of carefully applied residual sprays, supplemented by more frequent applications of exterior space sprays and the judicious use of larvicides, provides an effective procedure for reducing fly populations, almost to the vanishing point. Were cost not such an important factor, these procedures might be recommended for the control of flies generally. From the experiences of the Communicable Disease Center, it appears that the high degree of fly control required to eliminate the possibility of disease transmission by flies is not yet within the realm of economic reason by the use of chemicals, alone. This is not to say that the abatement of flies to a point below the nuisance level is not economically feasible. Like most insect control problems, there is a definite point of marginal return.

From the several diverse areas where CDC fly control activities have been conducted, it appears that the level of fly infestation can be brought down to the Scudder grill range of from 4 to 10 at a reasonable cost.[2] To reduce the level to a Scudder grill average of 2, or below, would necessitate a considerably greater expenditure.

The procedures used at the present time to bring about a reduction of flies in any community are[3]:

1. Improvement of sanitation practices
2. Screening
3. Application of residual sprays to selected fly resting surfaces
4. Application of larvicides in selected sites
5. Broadcasting of space sprays over extensive areas

Each of these items will be discussed separately, reserving the most important, sanitation practices, for the last.

Screening — Although screening has little effect on overall fly populations, adequate screening is still the most effective means of reducing possible contact between flies and human beings in a restricted area. Homes, food markets, restaurants, and similar establishments are attractive to flies, and therefore, should be safeguarded by screening.

Residual Applications[4]—The applications of insecticides having residual properties appear to be the most effective and economical means of controlling fly populations with chemicals. To date, DDT is the most widely used chemical in this field. During the past year, methoxychlor has come into favor for use in the spraying of dairy barns and chlordane has shown improved results in certain locations where "DDT resistant" fly populations have developed. At comparable rates of application, neither of these latter chemicals has produced such lasting residual action as DDT. For controlling flies, the normal application rate for DDT is 200 mg. per sq. ft. This is closely approximated by applying 1 gallon of 5 per cent DDT insecticide per thousand sq. ft. of surface area. In field practice, wetting vertical surfaces to the point of run-off will provide the desired results.

The 5 per cent DDT insecticides may be applied as emulsions, solutions, or suspensions, dependent on the type of surface area being treated.

On farms and in rural areas, residual treatment is applied to the interior surfaces of barns, privies, and other outbuildings where flies congregate. Exterior surfaces of outbuildings are also treated, should the interior applications fail to provide sufficient reductions.

On dwelling houses, provided screening is adequate, it is seldom necessary to apply residual treatment to the interior surfaces. Since the doorways are the usual points of access for flies, residual treatment of all surfaces adjacent to the doors is the only requirement. In the

absence of screening, residual treatment of all interior wall and ceiling surfaces of the home would be necessary.

In urban areas, the application of residual treatment to all possible fly resting surfaces is impractical. It has been found expedient to spray only those surfaces where flies congregate in the greatest numbers. This usually means the spraying of garbage cans and the walls, fences, or vegetation immediately surrounding. When spraying vegetation, it is necessary that emulsions or suspensions be used because oil solutions sear the leafy surfaces.

In the past, the results obtained from exterior residual treatments have been highly erratic. The duration of the effectiveness of residually treated surfaces exposed to weathering has been much shorter than comparable treatment of interior or partially protected surfaces.

Considerably improved duration has been obtained by the addition of an adhesive agent to the liquid sprays. The addition of the adhesive agent has proved advantageous only in the emulsion type sprays. By adding approximately 10 per cent pine gum rosin to a 25 per cent DDT-xylene concentrate the duration of effectiveness of residually treated exterior surfaces has been markedly improved. Exterior surfaces treated with emulsions derived from the above formulation may be expected to remain effective for as long as two months under ordinary conditions.

Larvicides—The role of larvicides in fly control operations is usually restricted to those locations where a super abundance of larvae is found in a compact breeding area. Reasonably successful results have been obtained by treating the surfaces of larval breeding media with emulsions containing from 2 to 4 per cent chlordane. The application rate is from 50 to 100 mg. of toxicant per sq. ft. of surface. The treatment of garbage cans in this manner has proved very effective in those residential areas where garbage cans comprise the only significant source of larval development. Should hog feeding be the means of garbage disposal, the use of potent larvicides is, of course, prohibited.

Privy pits and heaps of animal excrement may be similarly treated with larvicides.

Space Sprays (Exterior)—Exterior space spraying with mists or fogs, sometimes called "area spraying," has become an effective adjunct in the accomplishment of fly control in communities. Although the dispersal of insecticidal dusts has been used for agricultural purposes for many years, it is only with the recent development of new insecticides and specially designed equipment that the dispersion of very fine droplets of liquid insecticides has become practical. Many equipment manufacturers now construct machines which disperse liquid insecticides as tiny air-borne droplets. Although differing in detail, the machines are essentially similar in principle of operation, namely: the injection of a liquid into a high speed air blast. The air blast, usually aided by nozzles or other devices, breaks the liquid into very fine droplets and provides an initial velocity in a given direction. Some machines have heating elements which create thermal aerosols, thus providing very small droplets which appear as a fog instead of a mist.

Regardless of the particular type of equipment used, the aim to be accomplished is the dispersal of minute droplets of a liquid insecticide in a uniform pattern over an extensive area. In fly control operations, the objective of exterior space spraying is the destruction of that portion of the adult fly population which has escaped control by residual or larvicidal applications. Although spectacular, exterior space spraying cannot be relied upon to give more than temporary relief and its frequency of application is dependent on the extent of larval development in a given area.

For example, at an open garbage dump with literally millions of fly larvae and pupae present, space sprays must be applied at daily intervals if adult fly densities are to be kept low. On the other hand, a fine residential area with a very high level of sanitation may permit a lapse of as much as two or three weeks between space spray applications. Under ordinary conditions one application per week is the usual frequency.

Emulsions, or solutions, containing 5 per cent DDT are the most commonly used insecticides in exterior space spray machines. The normal application rate is 0.4 lb. DDT per acre, roughly 1 gallon per acre of 5 per cent DDT insecticide. Although the sprays may be wind-borne for long distances, the practical effective range of most machines, while in motion, does not exceed from 200 to 300 ft.

In addition to the application rate, the size of the droplets appears to have an important bearing on the effectiveness of exterior space sprays. From preliminary field experiments, the optimum droplet size appears to be in the range of from 20 to 100 μ. Droplets of lesser diameter are subject to the vagaries of even mild air currents, hence, are uncontrollable; while droplets of greater diameter subside too rapidly, thereby shortening the effective operating range of the machines.

Aircraft may be utilized as a means of applying space sprays,[5] in which case, the application rate of approximately 0.4 lb. DDT per acre is maintained. For light planes it is advantageous to apply solutions of higher DDT concentrations, say from 20 to 30 per cent DDT, as a means of increasing the potential coverage per gallon of solution.

Despite the advantage of aircraft in applying uniform insecticidal applications, the hazard involved in low altitude flights over populated areas is usually not warranted. Effective fly control can be accomplished by safer methods at no greater cost.

Whether space spray applications be made by airplane or ground operated equipment, they do not provide residual toxicity in the usual sense. Four-tenths of a pound of DDT per acre is equivalent to less than 10 mg. of DDT per sq. ft. When compared to the normal application rate for residual treatment, 200 mg. per sq. ft., its impotency is apparent. As yet, "DDT resistant" flies have not been a significant factor in the field application of exterior space sprays. Investigative work is under way, however, to find a more effective insecticide for this particular procedure, as well as for larvicidal and residual applications. To summarize on chemical methods of fly control; they are effective; they are practical; but most important, they are temporary.

As an example of their effectiveness, preliminary evaluation data from our fly control program in the city of Phoenix, Ariz. (1949), show that at the spring peak, fly levels were held to only one-eighth of levels reached in comparable untreated areas.

As to the practicality of chemical fly control operations, adjusted computations show that a reasonably high degree of fly control can be obtained at a cost of from 3 cents to 5 cents per capita per week of fly breeding season, *even with unimproved sanitary practices.*

As to the temporary nature of fly control by chemical means, the most vivid example is undoubtedly the experimental communities in Hidalgo County, Texas. Here, after conducting intensive chemical fly control measures for almost 2 years, it required only 3 weeks for the fly populations to approach their normal levels when insecticidal treatment was stopped! The futility of attempting to reduce fly populations without removing their breeding sources is obvious. The facts that common flies can run through from two to three generations per month, can lay upwards of 100 eggs at one time, and one female fly can deposit from 500

to 2,000 eggs in her 20 to 60 day lifetime, present insurmountable odds against the success of achieving real fly control by chemical means alone.

All of this leads to one final point, namely: *the only sensible approach to the control of flies on a community-wide basis is improved environmental sanitation.*

Farms and isolated groups of dwellings present a different problem from those encountered in urban areas. On the farm, one individual, or at the most two or three individuals, can define the fly control problem and decide which measures are required to cope with the situation. In community life the problems of fly control are not so simply stated. One individual may maintain his property scrupulously clean, may spray, larvicide, and screen, continuously, yet unless all his neighbors do likewise, he cannot prevent filth-bearing flies from roaming his properties and gaining access to his home. How, then, to combat the fly in communities? There is but one answer to that question—*sanitation*—specifically, improved methods of storage, collection and disposal of fly-breeding wastes from homes, commercial establishments and industry. Here, we might also include privies, which have been found to be much more common than most city officials supposed.

Privies serve, not only as a source of fly breeding, but as reservoirs of pathogenic organisms from which flies may become contaminated. There appear to be two major obstacles in the path of our efforts to obtain improved environmental sanitation as the principal fly control measure. First, relatively few people are aware that flies are proven bearers of disease organisms and, second, insufficient engineering talent has been brought to bear on the garbage disposal phase of environmental sanitation.

With regard to flies vs. disease, there is little that engineers can do. Be assured, however, that it is a proven fact that the control of flies, in areas of high rates of dysentery and diarrheal disease, can effect material reduction in the spread of those diseases. Furthermore, investigation as to the role of flies in the transmission of other diseases is progressing. As to the second reason, namely, lack of engineering interest in refuse disposal, while this interest is growing, its rate of progress is slow. It is slow because the only motivating force in the improved handling of refuse is one of esthetics, and engineers, as a rule, do not react quickly to that force. Let us substitute the new motivating force—*health*. The Hidalgo County experiments have proved that garbage and health are intimately related through flies.

Sanitary engineers have responded to the force of health measures in past years. Witness the replacement of the old night soil collectors with modern sewerage systems and treatment plants; and the replacement of private wells and cisterns with modern water treatment plants and distribution systems. Not far behind is the dairying industry with intricate pasteurizers and bottling devices. The urge to improve the processing of milk, water, and sewage was the recognition of their disease producing potential. Although the original research on these problems was performed prior to the turn of the century, most of the progress on the engineering phases has been made in the past 50 years.

Progress in the field of refuse disposal has lagged far behind. For the greater part, we still have our open dumping grounds, our open collection wagons and trucks, and our haphazard storage containers. True, advances have been made in some of the larger cities, but they have not permeated throughout all communities.

The proper storage, collection, and disposal of garbage and other refuse is a sanitary engineering problem. It should be recognized as such and not relegated

to others down the line for handling. From time to time, engineers have shown interest in the separate phases of the problem but as a rule, have treated them independently. Incinerators have been built and sanitary land-fills developed, with little effort to coördinate collection service or improve initial storage. Ingenious collection trucks have been devised but in some cases, the refuse is shoveled into them by hand and hauled to some unsanitary, fly breeding, hog farm. Many devices have been arranged for the storage of garbage and other refuse in a manner that would be inoffensive to the eye but little thought has been given to some of these devices as to how they could be kept clean.

In general, while progress is being made on each of the independent phases of the refuse disposal problem, the problem in its entirety has not been confronted. Just as the liquid wastes from home and industry are handled as a single problem from point of entry, through the sewerage system, to treatment plant and ultimate disposal, so should the problem of solid wastes be handled.

Here then, lies the challenge. The medical profession has shown that common flies are a significant factor in the transmission of certain diseases. Entomologists have provided detailed information concerning the habits and life cycle of common flies and a means of measuring their relative densities. Chemists have compounded unbelievably potent insecticides. The ultimate solution of the problem of community-wide fly control has been placed squarely at the door of the sanitary engineer; that is, the development of a complete system to provide for the sanitary handling of solid putrescible wastes, from their point of origin to their complete disposal.

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What Does the School Physician See?*

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WHILE the statistical recording of physical defects in school children has been carried on for a long time in many communities, the practice was discontinued in New York City several years ago. It was found that such data were not productive in solving the health problems presented by the pupils.

The emphasis was changed from the finding and correcting of physical defects to the health appraisal of children as *individuals* and the solution of the overall general health problems. The important entity was not the physical defect, but the living child who needed attention. To us this has been a more satisfactory approach to solving school health problems.

However, with an economic depression followed by a war, with alterations in population densities and changes in social attitudes, and lastly, but most important, with rapid advances in medical science, it appeared desirable to inquire once more as to the kinds and amounts of adverse health conditions our school children exhibit.

Are the same disease entities which we formerly recorded occurring now with greater or lesser frequencies? Are new conditions found? Which adverse health conditions occupy the school physician's interest today?

A brief survey among children attending elementary and junior high schools was undertaken in an effort to answer some of these questions.

PROCEDURE

For ten consecutive school days between March 14 and 25, 1949, 144 school physicians recorded on a standard form designed for this study, a diagnosis with pertinent biographical data for each pupil examined by him during the course of a routine school health session. No deviation from the usual school health session was made for this purpose.

In order to facilitate the study, certain limitations on the latitude of diagnoses were arbitrarily set for the sake of uniformity and accuracy in recording. They are listed below.

At the end of the study period, the data were analyzed statistically† and the results tabulated into 19 major groups based on classifications in the *Manual of International Statistical Classification of Diseases, Injuries and Causes of Death.*

INSTRUCTIONS TO SCHOOL PHYSICIANS

Please read and follow directions very carefully

1. For the ten (10) day school period beginning on March 14 and ending on March 25 inclusive, please enter a diagnosis on the attached survey form *for each child seen by you in the school.*

2. Use a separate survey form for each doctor session. All recording on this form is to be done by the school physician.

3. Diagnosis.

* Presented at a Joint Session of the Dental Health, Maternal and Child Health, and School Health Sections of the American Public Health Association at the Seventy-seventh Annual Meeting in New York, N. Y., October 25, 1949.

† See Acknowledgments.

A. Use both medical record (103S) and the pupil health card (104S) in determining diagnosis.

B. Give your own impression or any bona fide previous diagnosis which applies at the time of this survey. State in the proper column of the survey form whether the diagnosis is old or new; that is, whether it existed previous to this examination or was made at the time of this examination.

C. If more than one diagnosis is made, list the most important one first and then list the others.

D. When no clinical entity is discovered, write "Healthy Child" in the diagnosis column. Please do not leave any blanks in this column since it is the primary reason for making this survey.

4. No limitation is set on the diagnosis which may be made except for the following conditions:

A. *Eyes:* Include visual defects at 20/50 vision or worse, either eye, whether corrected or not; none below 20/50. Record other pathology, e.g., strabismus conjunctivitis, as found. Obtain the vision score from form 104S.

B. *Hearing:* Include audiometer scores of *20 or more decibels loss* either ear on test. Record other ear pathology, e.g., chronic otitis media, as found. Obtain audiometer score from form 104S.

C. *Dental Caries:* OMIT.

Include only *orthodontic conditions* requiring treatment.

D. *Nutrition:* The diagnosis of malnutrition including *over* and *underweight* should be based on your clinical judgment. Height and weight tables alone should not be used as an index.

E. *Cardiac:* Please classify, e.g., possible, potential, organic heart disease, congenital, etc.

F. *Abnormalities of posture* should be diagnosed in terms of specific orthopedic pathology. Do not make a diagnosis of "poor posture" without relating it to cause.

G. *Flat Feet:* Omit this diagnosis except when feet are definitely painful and require medical care.

H. *Endocrine disorders:* These are exceedingly rare and should be based on specific dysfunction demonstrated on thorough medical and laboratory investigation.

I. *Emotional and behavior problems:* List only when clearly present and in need of treatment.

J. *Mental deficiency:* Record only when definitely known (Low I.Q. C.R.M.D. class).

5. On the reverse side of the survey form, additional space is provided. You are invited to include here any comments or observations regarding a particular child that you deem pertinent or helpful.

RESULTS

There were 14,132 pupils seen by the 144 school physicians during the 10 day period. As shown in Table 1, 5,129 (36.3 per cent) were regarded as "healthy," i.e., having no adverse health conditions. In the remaining 9,003 (63.7 per cent) 11,171 physical or mental abnormalities were recorded. This is at a rate of 0.8 defect per child for the entire group, and 1.24 defect per child for the group in which adverse health conditions were found. "Dental caries" was purposely omitted from the study but orthodontic conditions were included.

There was no significant sex or color difference noted with respect to the distribution of defects. The average age was 9 years; range 4 to 15 years. The distribution by the number of defects

TABLE 1

Health Status of Children Examined by School Health Physicians, New York City, March, 1949

Percentage of Children, by Health Status, Color, and Sex

Health Status	Total Number of Children	Per cent of Total Children				
		All Children	Color*		Sex	
			White	Other	Male	Female
Healthy	5,129	36.3	36.3	36.7	36.8	35.7
With Defects	9,003	63.7	63.7	63.3	63.2	64.3
No. of Children	14,132	100.0	85.8	14.2	52.5	47.5
Average No. of Defects Per Child		0.79	0.79	0.78	0.79	0.79

* 167 children, or 1.1%, of all children, were excluded from the color distribution because color was not stated.

TABLE 2

Health Status of Children Examined by School Health Physicians, New York City, March, 1949

Number of Children by Number of Defects

Number of Defects	*Number of Children*	*Percentage of All Children*
None	5,129	36.3
One	7,201	51.0
Two	1,484	10.5
Three	275	1.9
Four	39	0.3
Five	3	0.0
Six	1	0.0
Total	14,132	100.0

per child is shown in Table 2. Of those having defects, 51 per cent had one and there was a sharp drop to 10.5 per cent of those having two and an even steeper drop for more than two defects per child. Considered by age groups (Table 3), no significant difference in the number of defects found is observed except for the 3–6 year group where the average was 0.66 defect per child. The number of individuals in the "not stated" age group appears too small to consider as of statistical significance. With the exception noted it will be seen that the number of defects per pupil does not change appreciably by age group.

However, when the type of examination performed is considered there were some differences noted.

There are four types of examinations routinely done in the school health service:

1. New Admission examination: a complete physical examination with parent present done on all newly admitted children who have not been examined for school entrance by a private physician.

2. Special referral examination: same as new admission, with parent present, but on children referred by teacher or nurse because of a health problem.

3. Screening examination: a rapid examination, without parent present, on children suspected of having an adverse health condition, to determine if further investigation is needed. About one-half of all children screened become subjects of a special referral examination.

4. Follow-up inspection: a check-up inspection or examination to determine progress in solving health problems found at some previous time.

An interesting finding was that although there was proportionately an equal distribution of white and non-white children examined as special referrals, i.e., presumably having a health problem serious enough to call the parent in, there were actually less defects found in the non-white than in the white group. This is shown in Table 4. When all types of examinations are considered, the number of defects per child showed no difference between the racial groups.

In a cross-sectional study of this nature, it is worth differentiating between newly discovered defects and those already known prior to the tabulation period. There were a total of 11,171 defects recorded of which 5,202 (46.6 per cent) were newly discovered during

TABLE 3

Health Status of Children Examined by School Health Physicians, New York City, March, 1949

Per cent Healthy, Average Number of Defects, and Per cent With Specified Numbers of Defects by Age

*Age**	*Total No. of Children*	*Per cent Healthy*	*Average No. of Defects*	*Per cent of Children With Defects*							
				Total	*None*	*One*	*Two*	*Three*	*Four*	*Five*	*Six*
3–6	3,774	47.5	0.66	100.0	47.5	41.1	9.2	1.9	0.3	0	0
7–10	5,455	32.0	0.84	100.0	32.0	54.9	10.8	2.0	0.3	0	0
11–14	4,390	32.1	0.83	100.0	32.1	54.8	11.0	1.9	0.2	0	0
Over 15	412	38.1	0.82	100.0	38.1	45.9	12.9	2.7	0.4	0	0
Not Stated	101	20.8	1.03	100.0	20.8	59.4	16.8	2.0	1.0	0	0
Total	14,132	36.3	0.79		36.3	51.0	10.5	1.9	0.3	0	0

* Age at last birthday.

TABLE 4

Health Status of Children Examined by School Health Physicians, New York City, March, 1949

Per cent Healthy, Average Number of Defects, and Per cent of Total Examinations, by Type of Examination

Type of Examination	Per cent Healthy			Av. No. of Defects			% of Total Known Exams	
	White	Other	Not Stated	White	Other	Not Stated	White	Other
New Admission	57.7	50.3	45.8	0.56	0.65	0.96	23.0	32.1
Special Referral	26.5	41.4	17.9	0.99	0.79	1.29	18.2	18.2
Screening	38.9	36.5	33.3	0.71	0.71	0.77	26.1	17.3
Follow-up	24.6	20.9	14.0	0.90	0.95	1.22	32.7	32.4
Total Known	36.3	36.8		0.79	0.78		100.0	100.0

the 10 day study. The distribution of newly discovered defects by type of examination is shown in Table 5. While

TABLE 5

Health Status of Children Examined by School Health Physicians New York City, March, 1949

Per cent of Total Exams, and Per cent of Total New Defects, by Type of Examinations

Type of Exam	Total Examinations	Total New Defects
New Admission	24.4	36.2
Screening	24.8	31.1
Special Referral	18.2	24.2
Follow-up	32.6	8.5
Total	100.00	100.00

the new admission examinations accounted for 36.2 per cent of the total new defects, this group constituted but 24.4 per cent of the total population under study. It can be shown, however, that of the total number of defects discovered in the new admission group 94.5 per cent were new, as would be expected. In like manner, 65 per cent of all defects noted in the "Screening" group were new. The figure is 50.7 per cent for the "Special Referrals," and 10.5 per cent of all defects found on "Follow-up" examinations were new.

DIAGNOSTIC GROUPINGS

There were 255 distinct clinical diagnoses made. For convenience in analysis these were placed in 19 categories as mentioned previously (Table 6). They are discussed in order of frequency of occurrence.

It should be kept in mind, when examining the data and comparisons below, that the present group is composed of children who came to the medical room for one reason or another during the study period and, in the statistical sense, are a "select" group even though the composition of the group was no different from that seen in any routine doctor's session in the school.

Group I—Nutritional: This includes both obesity (8.6 per cent) and under par condition (10.3 per cent). The figure compares favorably with the findings in the Philadelphia Schools[1] in 1947 when 22 per cent were recorded as having nutritional disorders of which 14.1 per cent were malnutrition and 7.9 per cent obesity. In determining nutritional status the physician followed the instruction listed above. We regard the taking of history and clinical appraisal by the experienced school physician as the most practical way to arrive at a reasonable conclusion. Height and weight tables are considered of very limited value.

Group II—Upper Respiratory Infections: Of the 17.5 per cent of pupils in this group 12.4 per cent were diagnosed as having diseased and hypertrophied tonsils and adenoids. This corresponds closely to the report of the Philadelphia Schools[1] for 1947 when 12.3 per cent had hypertrophied tonsils. The present findings are in sharp contrast to those of the Astoria Study[2, 4] in 1938–1939 when

TABLE 6 *

Health Status of Children Examined by School Health Physicians, New York City, March, 1949

Number of Children, and Per cent of Total Children, in Specified Diagnostic Groups

Diagnostic Group	*Number of Children*	*Per cent of Total Children*
I. Nutritional	2,675	18.9
II. Upper Respiratory	2,478	17.5
III. Cardiac	972	6.9
IV. Vision	894	6.3
V. Behavior & Emotional	815	5.8
VI. Orthopedic	483	3.4
VII. Allergy	346	2.4
VIII. Skin	332	2.3
IX. Ear	237	1.7
X. Circulatory System Except Heart	233	1.6
XI. Malocclusion	206	1.5
XII. Other Diseases of the Eye	183	1.3
XIII. Other Diseases of the Digestive System	166	1.2
XIV. Congenital Malformations	143	1.0
XV. Diseases of the Blood & Blood Forming Organs	128	0.9
XVI. Other Diseases of the Nervous System & Sense Organs	119	0.8
XVII. Infective & Parasitic Diseases	118	0.8
XVIII. Diseases of the Genito-Urinary System	100	0.7
XIX. Other Miscellaneous Diseases	543	3.8

* Since some children are included in more than one diagnostic group, the sums of the numbers and percentages in this table are respectively greater than the total number of children with defects and the per cent of all children with defects. In a few cases, a child may appear twice in the same diagnostic group because he had two different diagnoses in the same group.

54 per cent of new admissions and 53 per cent of special referrals had hypertrophied tonsils. In a study by the U. S. Public Health Service[3] in 1931 there were 30.68 per cent of 30,000 school children who were recorded as "Tonsil Defective" (enlarged, diseased or both). The present finding seems to reflect a decided shift in the past ten years away from the diagnosis of "T & A" in school children.

Group III—Cardiac: The classification of the American Heart Association was used in recording diagnosis of this group. There were 972 or 6.9 per cent of all examined who fell into this group. Possible and potential heart disease accounted for the greatest number, or 4.2 per cent, while 1.9 per cent had organic heart disease and 0.8 per cent were classified as congenital heart disease. In addition, 1.6 per cent of the children had functional murmurs. This appears to be an unusually small percentage for functional murmurs. Our figures are somewhat higher than those of the 1947 Philadelphia report and of the U.S.P.H.S. study previously mentioned.

Group IV—Vision: Since rather sharp limitations were placed on this diagnostic group—only visual defects of 20/50 or worse were included—the per cent defective (6.3 per cent) is probably somewhat low. Other large surveys range from 12 per cent to 32 per cent defective. The criteria for inclusion as visual defects in these surveys were probably less stringent than ours.

Group V—Behavior and Emotional Disorders: This group, the fifth most frequently found disorder, included 5.8 per cent of the children. Only children regarded as requiring psychiatric therapy were included here. Thirteen different clincial diagnoses were made on the 815 children in this group. Our figures are higher than in other similar surveys and approximate those of the Selective Service examination.[5-7]

Group VI—Orthopedic: Of the 3.4 per cent of pupils with orthopedic defects the largest single clinical group had scoliosis, 1.4 per cent. The remainder had 15 different clinical diagnoses, among which flat feet accounted for 0.8 per cent. A reference to the "Instructions

TABLE 7

Health Status of Children Examined by School Health Physicians, New York City, March, 1949

Diagnoses Showing Statistically Significant Differences Observed in Color and Sex Groups*

	Percentages				
	Color		Sex		
Diagnosis	*White*	*Other*	*Male*	*Female*	*Groups With Higher Prevalence*
Obesity	9.6	2.7	7.0	10.3	White and Female
Malnutrition	–	–	9.1	11.6	Female
Upper Respiratory Infections	15.3	23.0	15.7	17.4	Other, Female
Behavior and Emotional	5.7	4.3	7.2	3.8	White, Male
Curvature of Spine	1.5	0.7	–	–	White

* By the Chi Square Test, using a one per cent level of significance.

to School Physicians" will explain why there were so few flat feet found.

Group VII—Allergy: This group consisting of six clinical entities accounted for 2.4 per cent of all defects. Slightly over half the cases were due to asthma.

Group VIII—Skin Diseases: It is interesting that only 2.3 per cent of all children examined had skin diseases. Nineteen different diagnoses comprised the group. Fifty years ago, when school health services were started in New York, skin diseases were high on the list of physical defects.

Group IX—Ear: Here again the criteria for hearing loss was sharply defined and based on audiometric tests. Twenty or more decibels loss either ear was the minimal hearing threshold for inclusion in the group. The total ear defects amounted to 1.7 per cent with defective hearing accounting for 0.7 per cent. There is wide variation in the findings of other surveys, probably related to techniques in testing and otological examination, so that comparison is difficult.

COLOR AND SEX DIFFERENCES

Prior to a discussion of the last ten groups it may be well to point out that though there were no color or sex differences as to the number of defects found, some individual clinical entities presented statistically significant differences with respect to color or sex as shown in Table 7.

Obesity was more prevalent in whites and females.

Malnutrition showed no color differences but was higher in the female.

Upper Respiratory Infections were more prevalent among the non-whites and in the female.

Behavior and Emotional was higher among the whites and males.

Curvature of the Spine showed a color difference, being more prevalent among the whites, but there was no sex difference.

Other adverse conditions found did not show any statistically significant differences as to color or sex.

Groups X–XIX comprise over 180 clinical entities, and while they represent singly too small a proportion of the total to warrant any statistical analysis, they included numerous interesting and rare clinical conditions which require great skill and sharp diagnostic acumen on the part of the examining school physician.

To mention but a few clinical entities of medical interest represented in this group: anemias of all forms and blood dyscrasias, such as leukemia, sickle cell anemia, and Banti's disease were noted. There were also cataracts, keratitis, retinitis and appendicitis, diverticulitis, pancreatitis and splenitis, meningitis, encephalitis, poliomyelitis, nephritis, and hepatitis, congenital mal-

formations, all common contagious diseases, renal calculi and congenital absence of a kidney, hernias, gastroptosis, and tuberculosis, from acne to verucca and from albinism to Von Recklinghausens disease, from adrenogenital syndrome to schizophrenia and from malaria to manic depressive psychosis and pediculosis, from all forms of traumatic accidents to pregnancy, of which there were five cases found in the ten day study period.

COMMENT

Some pertinent observations on the findings listed above appear to be in order.

There were no statistically significant differences in the average number of adverse health conditions found as to *color* or *sex*. The number of defects per pupil did not show any appreciable difference by *age* group either.

Of the diagnostic groupings in order of frequency, nutrition leads the list with 18.9 per cent, of which malnutrition constituted 10.3 per cent of the total number of children examined. This is in striking agreement with results of a nutrition survey [8] made on pupils of the public schools of New York State in 1947 (10 per cent of the children examined showing lesions which were perhaps suggestive of poor nutrition). Other dietary surveys, on the other hand, using National Research Council recommended allowances as a criterion, quote a far greater prevalence of malnutrition.

Another important observation was that only 12.4 per cent of all examined were diagnosed as having "Diseased Tonsils and Adeniods," whereas about a decade ago this diagnosis accounted for over 50 per cent. This is due undoubtedly to a changing attitude on the part of physicians in using more valid criteria for the diagnosis and recommendation of a "T & A" and a greater emphasis on the whole child rather than merely on an isolated finding.

Defective vision was diagnosed in only 6.3 per cent in our survey, a rather low incidence as compared with other studies.[1-4] The discrepancy is perhaps due to the fact that a diagnosis of defective vision was limited to a visual acuity of 20/50 or worse in the affected eye.

Emotional and behavior problems were included in the diagnostic grouping only if they were in need of psychotherapy and additional investigation. A prevalence of 5.8 per cent in this category is higher than found in some other surveys [1, 2] on school children, and it may be due to an increasing awareness and a greater emphasis on the importance of detection and diagnosis of behavior and emotional disorders.

It must be emphasized that, excepting 24.4 per cent of all examined which were routine examinations on new admissions, the remainder of the study group was a selected sample. In the main they were children referred to the medical room because of a *possible* health problem.

Our findings should therefore not be interpreted as representing frequency of defects in all school children. This, of course, in no way detracts from the purpose of the study which is to determine what the school physician sees during the course of a doctor session in school.

The 19 major diagnostic groupings included 255 distinct clinical entities, some commonly found, while others were uncommon, obscure, rare, and even bizarre, a few of which were enumerated above. One hundred and forty-four practising physicians working in the schools, part time, detected these adverse conditions in the school children. It is obvious from a perusal of the adverse conditions found that the school physician must be very alert, well trained, and with sufficient time to do an adequate health examination. Happily these conditions prevailed in our study.

SUMMARY AND CONCLUSIONS

1. Data are presented on 14,132 public school children examined during March, 1949, in New York City.
2. Of all examined 36.3 per cent were found "Healthy," 63.7 per cent had adverse health conditions, i.e., "physical defects."
3. There were 11,171 defects found, an average of 0.8 defect per child for the total group studied, and 1.24 defects per child for the group with defects.
4. Of the total defects found, 46.6 per cent were newly discovered during this survey.
5. There were 255 distinct clinical entities discovered. These were put into 19 major diagnostic groupings.
6. Except for a few clinical entities, there were no statistically significant differences for the average number of defects according to color, sex, or age.

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Early Cancer Detection Film

Breast Cancer: The Problem of Early Diagnosis is the second film now being distributed in a professional series sponsored jointly by the American Cancer Society and the National Cancer Institute. (See *A.J.P.H.* (Apr.), 1949, p. 566, for notice of the first in the series.) The film was reviewed and enthusiastically received by the December, 1949, meeting of the American Medical Association in Washington. It is designed to help physicians diagnose and treat early cases, which it is believed would cut the death rate from breast cancer in half. Presently of the 50,000 cases diagnosed annually more than half make mortality records in 5 years.

The film, made as audiovisual instruction for physicians and medical students is animated, in color, with sound and runs 34 minutes. It can be borrowed from state health departments, the American Cancer Society (47 Beaver St., New York City), or from the regional depots of Associated Films (Chicago, Dallas, San Francisco). The American Cancer Society has it for sale at $146.20 including a supply of explanatory pamphlets and promotional folders.

Clinical Audiology in Public Health and School Health Programs*

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WITHIN the past ten years there has developed a nation-wide consciousness of the special needs of those with impaired hearing, and with this development has come the synthesis of a new branch of science, audiology, the science of hearing. Its field is the understanding of the auditory functions and the treatment of those with impaired hearing. Obviously, these objectives are not new. For a great many years a group of special educators, a few otologists, some physicists and engineers, and a small but spiritedly humanitarian group of laymen, have dedicated their work to the special problems of those who, for one reason or another, have suffered the consequences of impaired hearing. With the advancements of modern electronics, however, and the adaptation of the midget vacuum tube for use in a wearable hearing aid, many new techniques of diagnosis testing and rehabilitative training have been presented, and many more are under study. Recently developed medical and surgical procedures are not only producing positive results in prevention and conservation, but, perhaps more important, are stimulating the interest of the clinical otologist and the pediatrician in a field where their special knowledge and skills are fundamental requirements. Then, too, of great importance to the present status of audiology, is the rich experience gained from the work during World War II in the service rehabilitation centers where the special handling of casualties with hearing disability marks one of the outstanding humanitarian projects of military medicine; where, for the first time the best of theory and practice, of personnel and equipment, was concentrated in a tremendous rehabilitative effort. Finally, the present field of audiology, in all its aspects, involves the application of the knowledge and experience of a dozen different sciences, research and clinical, all of which are, and presumably will continue, growing and developing.

On account of the nature of auditory function and dysfunction, there are both preventive and conservational aspects of audiology. Because of the etiologic pattern that obtains in hearing disability, the prevention of hearing impairment is perhaps the most important phase of audiologic work. Because of the close relationship between impaired hearing and developmental behavior in children, the earliest possible diagnosis is indicated. Because hearing disability inevitably promotes deviant behavior, with varying degrees of consequences to the individual's welfare, the problems of conversation are of special clinical significance. For all these reasons, the work of audiology is of particular importance at the public health level where both

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preventive and conservational programs can be administered effectively.

The nature and extent of such an approach are perhaps best examined in terms of the nature of the problems of impaired hearing, and the significance of these problems to the individual. Because the core of both preventive and conservational work is centered in the child, the present discussion is limited to aspects of the field which relate to children. The fundamental idea upon which to build an understanding of the problems of impaired hearing is that its effect is always more extensive than the dysfunction of the hearing mechanism itself. However we may define hearing functionally, it is never an end in itself, nor solely an activity of the end organ. In biological terms, it is a means of contact between the individual and his environment; in behavioral terms, it is the pathway to much that we understand as normal development; in social terms, it creates, with speech, the communicative link with our fellows at all levels of activity. Whatever the extent of the impairment—moderate, severe, or profound—it inevitably interferes with the development and behavior of the child; and, because of the psychosocial implications of hearing, the effect of impairment may be pervasive in the extreme.

There is no doubt that the incidence of impaired hearing among children is high. There is much in the way of statistical data available, but for several reasons, particularly the lack of uniformity in testing-techniques, precise information is not readily forthcoming from the statistics. There is reason to believe, however, that about 5 per cent of children have impaired hearing which may interfere more or less seriously with health and behavior; if the acute and seasonal incidents are included, the figure exceeds 10 per cent. Rather more difficult to determine is the number of children with a handicapping impairment. Such an estimate is frequently governed by definition and attitude on the part of the interested agency.

Obviously, any physical disability of this proportion and significance calls for attention, in preventive measures if these are possible, otherwise in conservational steps to provide every reasonable rehabilitative procedure for the affected child. For several years, screening procedures have been undertaken in several states, usually as adjuncts to school health programs, to select the children who present symptoms suggestive of or connected with impaired hearing. Yet, a recently published estimate, derived from careful sampling on a national scale, suggests that only 11 per cent of school age children have their hearing tested; and this figure has no reference to preschool age children.

Moreover, as is perhaps inevitable in a relatively new field, the indicated treatment and follow-up of the detected cases sometimes exists more on paper than in clinical practice, even for large numbers of this 11 per cent of one group of children. Presumably this is true because there is usually no agency, medically centered, to undertake responsibility for a complete program of diagnosis, therapy and rehabilitative or reëducative treatment. Considering what is known and clearly demonstrable about preventive measures and about rehabilitative and reëducative steps to be taken, we must observe that this whole problem of impaired hearing calls for concerted handling at the public health level, to be carried on in maternal and child health, school health, and crippled children's programs that have as yet scarcely been conceived. There is considerable information, fairly recently acquired, to support this point of view.

Assuming that three categories of hearing impairment—marginal, moderate-to-severe, and profound—are all-inclusive, we may observe that the problems of prevention center largely in the marginal group, while the problems

of conservation exist in all three groups. Much of the marginal impairment is caused by conductive-type lesions that may often be reversed or mitigated if treated early enough. Almost without exception, a profound hearing loss involves a perceptive lesion. A moderate-to-severe hearing loss may involve either conductive or perceptive, or mixed-type lesions. The nature of the impairment is a matter of careful diagnostic determination. While there is no generally demonstrated treatment for perceptive impairment, there is much to be done to alleviate conductive impairment, whether it exists by itself or in conjunction with a perceptive lesion.

It may be noted that the term *deafness* has not been used heretofore in the present discussion. This was not an oversight. With modern refinements in the instrumentation and techniques of diagnostic testing, it has become apparent that the instances of total hearing loss are relatively infrequent and are usually limited to cases in which the entire cochlear-vestibular function of the VIIIth nerve system has been grossly insulted. Yet the term *deaf* is still generally applied to any child whose hearing loss is sufficient to handicap or cripple normal development and normal activities. This state of affairs is anomalous and misleading. We do not call blind the child whose vision is 8/20 or even 4/20. Yet the child with hearing impairment to the extent of 70 decibels below normal for speech-hearing activities (a profound hearing loss) is labeled deaf, and often institutionalized and educated in such a way that he can never be anything but an exceptional person, different from most of his fellows in the activities that hold men closest to each other—the communicative activities of conversational exchange. Nowadays, when a visual defect is demonstrated, corrective work is initiated if possible, appropriate lenses are prescribed, parents and teachers are alert to the child's special needs, and considerable effort is exerted in an attempt to meet these needs. What a contrast with the situation with regard to hearing impairment! Unfortunately, perhaps, a handicapping hearing loss does not show, the way a misshapen limb, or a missing finger, or poor vision "show." As a consequence, there is little public knowledge or awareness even of the function of hearing, much less of hearing impairment. In audiologic terms, the use of a hearing aid, auditory training, speech (lip) reading skills, and speech training are the counterparts of corrective lenses and eye exercises. Eventually, one hopes, the hearing aid will be as much taken for granted as the glasses. Without question, most children with a permanent, irreversible speech-hearing impairment in excess of 30 to 35 decibels should use amplification. How much and what kind of amplification, and the way in which its use is incorporated into the child's daily life, are matters to be determined by audiologic study of the individual child.

The core of both preventive and conservational work with hearing impairment lies in accurate medical diagnosis and treatment as early as possible. It is perhaps axiomatic that the treatment of a physical condition without due attention to the various psychosocial factors related to the individual's needs, cannot bring about the desired achievement of maximum health. Accordingly, we refer not to the treatment of the ears, but to the treatment of the communicative disorder caused by hearing disability. Therefore, prevention consists not only of the reversal of clinical or subclinical symptoms of the ear, but also the mitigation of collateral symptoms that interfere with adequate behavior and normal development.

For various reasons, most of what has been done about impaired hearing has centered in the school-age child: the school system presents a workable ad-

ministrative system for case finding; the presence of hearing impairment at school age interferes with the child's education and obviously something must be done about it; the school system, among the large units of public agencies, is presently best able to finance such a fundamental matter of physical status. Yet the public school system covers only a part of the pertinent job. Aside from those school age children not in the public school system, there is the whole group of preschool age children, where the problems of prevention and conservation are even more important.

The child from 3 to 6 is at his peak as a language-learning, developing, behaving personality. Whatever interferes with the normalcy of these activities in this age range takes its greatest toll in the development of the child. In the past, the diagnosis of hearing impairment in the preschool age child has been difficult to achieve, largely for the reason that routine diagnostic tests for young children are either rough or are subjective, and because special testing is not only difficult but time consuming and requires special equipment and specially trained personnel. These are not impossible obstacles, in light of present knowledge. There are few clinical tests of complex physical function that are not time consuming and exacting, when they are done well.

Within the past few years, a great deal of work has been devoted to diagnostic testing of auditory acuity in young children, most of it keyed to the theory of the conditioned response, and to the use of meaningful test sounds of known pitch and loudness. Very recently, objective audiometry—requiring no active participation on the part of the child—has been successfully demonstrated. With these recent developments has come the conviction that one is rarely dealing with a black and white distinction between hearing and deafness. Any experienced clinical audiometrist should be able to determine whether or not a child has profoundly impaired hearing; but between the level of profound hearing loss and subclinical hearing loss there lie dozens of levels and degrees of impairment, which must be interpreted in terms of the child's physical and psychological welfare. If the 3 year old has a 50 decibel impairment, the time to do something about it is at the age of 3, not at the age of 5 or 6 when the child enters school, after he has accumulated the deviant behavior of inadequate hearing, poor speech development and social maladjustment that usually derives from a 50 decibel impairment. So far as basic speech-hearing activities and related behavioral development are concerned, the child's career does not begin at school age, but in infancy.

Directly related to this state of affairs, is the distinction between congenital and acquired hearing impairment. For the educator, this distinction turns upon whether the impairment has precluded the learning of language; and, largely because of this distinction, has come the habit of thinking in terms of *hard of hearing* or *deaf children*. There is a difference in educative methodology, because the two groups of children present different problems in education; but this distinction is educative not clinical. The clinical task is not to educate the child, but to diagnose, analyze, and treat the physical disability, and to institute remedial or rehabitative steps to offset the communicative disorder as early as possible. With adequate otologic and audiologic clinical work, the 2 year old, presently considered deaf, may by school age arrive at a much better functional status and, accordingly, be that much better off, better developed and more readily educable. So, too, the 3 year old with a severe impairment, now often educated in a special institution, may after early treatment and adequate remedial measures be able to enter and hold his own in regular school. Special

institutional training or repeated grades and psychosocial maladjustment related to impaired hearing, are costly — in money, in time, in personnel, and in behavior. The savings accrued from an adequate program of prevention and conservation will more than pay their way in the community.

Clinical audiology, carried out in the terms suggested here, requires specially trained personnel, professional persons expert in the treatment of communicative disorders, skilled in diagnostic testing, familiar with both hearing and speech problems, cognizant of workable rehabilitative methods, and aware of the needs of the child for special education. At present there are relatively few persons with these interests and this training. Aware of this fact, several universities—Syracuse, Pittsburgh, and Johns Hopkins in the East; Western Reserve, Northwestern, and Washington, in the Middle West, to name a few—have recently begun graduate-level work in audiology. Some of this work emphasizes training in special problems—cleft palate, cerebral palsy, and the like. At Johns Hopkins it was felt that a training program in audiology and speech could be designed to meet some of the special needs in public health and this course is now a major under Physiological Hygiene in the School of Hygiene and Public Health, where ample opportunities exist for clinical, research and field training at the doctorate and master's level in public health work. So far as we know, this is the first course designed especially to meet some of the needs for personnel of the sort of programs under discussion.

What does such a program entail? First, extensive public education, so that the community may learn the significance of hearing and of hearing impairment in terms of health, of behavior, and of vocation. Second, adequate case finding from all possible sources, including referral from all agencies concerned with children. Third, thorough diagnostic examination as a concommitant of complete pediatric appraisal. Fourth, medical and surgical treatment as indicated. Fifth, audiologic study and consultation, including the initiation of whatever remedial steps are indicated to compensate for communicative disorders. Sixth, special education according to the needs of the child. Seventh, referral for vocational rehabilitation and guidance so that the individual may achieve the optimum of self-sufficiency. These steps should be so organized that there is close interplay under medical direction in case finding and in both medical and non-medical aspects of case handling, and genuine insight on the parts of parents, teachers, nurses, guidance counsellors, social workers, and everybody else who is in contact with children. Ideally, there should be continuity and smooth transition between maternal and child care, school health and crippled children's and vocational rehabilitation services, and between preventive and conservational measures. At the very least, every community should have access to at least one center, preferably within the organization of a pediatric service. What part of this may be public and what part private, and what specific agencies are concerned, are matters for the community's determination. Moreover, there are readily apparent differences between urban and rural communities in both needs and methods. The point is that the prevention of hearing impairment and the conservation of residual hearing are fundamental steps in the health and welfare of a vast number of children who, for better or worse, are tomorrow's citizens. These problems therefore commend themselves to full consideration at the public health level of thought and action.

Practical Public Relations in a Local Sanitation Program*

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SANITATION personnel have a major responsibility in the promotion of good public relations. While press contacts, coördination of community groups interested in public health, and the many functions of health educators are vital to public acceptance and support of sanitation programs, this paper will cover some of the public relations activities that can best be carried out by sanitation personnel.

Policies and programs can be planned and developed through staff conferences of the sanitation personnel and meetings with affected community groups. Public participation is a fundamental principle of the democratic process. When the public participates in developing a sanitation program they become "sold" on the programs they have helped to plan.

Interdepartmental relations are closely related to public relations. The public is confused and even angered by conflicting regulations and duplication of inspections, unless the work of various departments is well coördinated.

A few years ago the Los Angeles City Health Department and the public had many unpleasant experiences from extensive overflowing of private sewage disposal systems installed under permits issued by the Plumbing Division of the Building Department, in subdivisions approved by the Planning Commission. The Plumbing Code required only a 12 foot deep cesspool; no septic tank was required. There was no provision for considering soil or ground water conditions. For F.H.A. financed dwellings, however, the Health Department required systems meeting modern sanitary engineering standards.

Bank officials and builders were critical of the extra requirements imposed by the Health Department as conditions requisite to F.H.A. approval. By meetings with the bankers, real estate developers, building contractors, private sewage disposal contractors, and the Building Committee of the Chamber of Commerce, we obtained energetic support for a coördinated program. The Planning Commission now approves no unsewered subdivision, without Health Department approval and recommendations. A map prepared by the Health Department in coöperation with the Water Department, shows all unsewered areas where private sewage disposal systems should not be installed or where special investigations of individual lots must be made. The City Council adopted a sewage disposal ordinance for private buildings which is administered by the Building Department and incorporates requirements acceptable to F.H.A. and the Health Department. No building permits may be issued for lots in "precautionary areas" unless special investigations show that suitable sewage disposal systems can be installed. The Health Department approves all private

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industrial and commercial waste disposal installations.

The Executive Secretary of the "County of Los Angeles Committee for Church and Community Coöperation" recognized that decent housing is a primary requisite for normal family life. He "sold" the Chairman of the Health Committee of the City Council on the advisability of initiating a housing survey program utilizing procedures developed by the American Public Housing Association Committee. The resulting survey has developed coöperation between the City Housing, Planning, Redevelopment, and Health Commissions which produced many community benefits. Information from the surveys was of major value in promoting a request that recently provided an initial allotment of 10,000 low-rent public housing units for the city.

The close relations developed with the Housing Authority resulted in establishing high priority for families needing placement in low-rent public housing because of eviction through Health Department condemnation proceedings. A large group of rooming houses and apartment buildings was acquired by a city department for future extension of the Civic Center. These had been leased to private real estate management organizations. When the survey showed extremely low maintenance standards, direct responsibility for management and operation was turned over to the Housing Authority. The resulting maintenance and sanitation program, developed in coöperation with the Health Department, has produced high standards of maintenance and sanitation with no decrease in net revenue to the city and, in many cases, with lower rents charged to occupants.

Redevelopment Agency funds are expected soon to be made available for paying salaries of eight additional Health Department Sanitarians to be assigned to housing surveys.

Wartime food sanitation enforcement problems resulted in the formation of a Food Sanitation Advisory Committee. This gradually developed into a formal committee which has been meeting once a month for about three years. Membership includes the heads of almost all food industry and labor groups including restaurant, tavern, dairy products, bakery, grocery, meat, druggist, ice manufacture and distribution, fruit and vegetable, vending machine, pest control, and several other associations. Unions for cooks, miscellaneous employees, meat cutters, bartenders, teamsters and others are represented. The Health Officer actively participates in all meetings. The City Attorney and the Chairman of the Health Committee of the City Council are members. At the invitation of the committee, sanitation directors of surrounding communities now attend the meetings.

William Bradford, the Restaurant Association Secretary, is the present Chairman. The cook's union representative is Vice-chairman and the Sanitation Bureau Director is "coördinator." The committee supported increases in health permit fees which increased revenues by about $150,000 a year to "provide an educational program, more and better trained sanitarians and additional consulting service to the food industry." They helped draft comprehensive ordinances on general food sanitation, box lunches and sandwich stands, food transportation, ice manufacture and distribution, lighting of taverns and restaurants, and many other related subjects.

There are usually at least six active subcommittees considering subjects like dispensing coffee cream at restaurants, "sneeze-boards," and meat, bakery, or ice sanitation. The work and deliberations of each subcommittee are guided by a Health Department coördinator. He is the sanitarian or engineer who is directly responsible for the department's program in the subject assigned to the

subcommittee. In coöperation with the chairman he arranges meetings, does field research and investigations, reviews literature in the field, and otherwise guides the committee in sanitation principles.

The industry and labor executives regularly distribute sanitation information to their members through their publications and newsletters. Attendance at food handler training programs is encouraged and stimulated through special bulletins distributed by them. The editor of the local *Food Sellers Digest* attends the meetings and regularly publishes the important news items.

The Education Subcommittee helped to develop various food handler training programs. It designed certificates for establishments whose managers completed the "Institute" and for individual "graduates." Members of this committee are now helping to plan sound-color movies produced by the department and are developing radio and television programs to inform the public of the industry-health food sanitation program.

Industry training programs usually consist of four 2 hour sessions or six 1½ hour meetings held weekly. Separate programs for managers and responsible employees of restaurants are conducted about six times a week. Other "institutes" include annual programs for pest control operators, bakery distributors, bulk-drink-vending machine service-men, milk plant employees, and dairymen and milkers. Sanatorium and rest home operators and employees, and several other groups are now requesting programs.

It was repeatedly observed that food establishments built in accordance with plans approved by the Building Department were not in conformance with health regulations. The Building Department Director agreed that it would be desirable to incorporate Health Department requirements in the Building, Plumbing, Electrical, Heating and Ventilating and Refrigeration Code books.

A "Food Equipment Manufacturers and Distributors Advisory Committee" was formed. This group includes representatives of hotel and restaurant supply companies, the gas and electric companies, the Institute of Architects, the Building Contractors Association, the Heating and Ventilating and Refrigeration Engineers' Associations, and range, dishwashing, and other equipment manufacturers and installers.

A rough draft of a comprehensive proposed ordinance was prepared by the staff of the Sanitation Bureau. For more than a year the industry committee held monthly meetings. Their chairman appointed subcommittees on subjects like hot water requirements, plumbing installations, construction features, wall and floor materials, refrigeration, ventilation, and general equipment design.

Those groups held many separate meetings, submitting their reports to the whole committee. A comprehensive food establishment construction and equipment installation ordinance was finally agreed to. The ordinance was considered at joint meetings of the Equipment Committee and the Food Sanitation Advisory Committee. The latter committee considered the problems of the operators "who would pay for the installations made in accordance with the ordinance." Finally, both groups reached complete agreement and the ordinance has now been approved by the Health and Building Commissions. An ordinance with such extensive backing is almost certain to be adopted by the City Council.

Nearly every sanitation problem affects some group which appreciates an opportunity to participate in discussions. We recently consulted with operators of public stables, private horse owners associations, poultry and rabbit raisers, pigeon fanciers, and numerous other groups to develop an improved fly con-

trol and sanitation ordinance affecting their places. One hundred or more persons attended some of the meetings and finally approved a comprehensive program, including an ordinance.

An ordinance regulating laundry, linen supply, and coin-operated laundry machine businesses was developed after numerous consultations with at least six organizations including the Chinese Laundrymens Association.

Our well drilling ordinance was developed with, and supported by, the Well Drillers Association. The Trailer Park and Motel Associations are considering a new comprehensive law affecting their businesses.

The Industrial and Manufacturing Committee and the Industrial Health Committee of the Chamber of Commerce recently approved our proposed industrial sanitation program. Their Air Sanitation Committee has held monthly meetings for several years, and has actively supported a comprehensive program of air pollution control.

A few years ago it was observed that many local food establishments were heavily infested with rats and roaches, in spite of the fact that they were paying monthly service charges to pest control firms. Naturally a substantial part of the infestations was due to improper construction and maintenance of the food establishments. Conferences with pest control operators revealed that competition had apparently caused certain firms to cut prices to a point where they could no longer afford to do a thorough job. Through these conferences, and subsequent training programs, pest control operators became almost as aware of the importance of sanitation as the department sanitarians. When the food industries were informed of their responsibilities for maintaining pest free establishments they were generally receptive to the suggestions of the pest control operators. The problem was, to a large degree, solved.

When it was determined that coin-operated bulk-drink-vending machines were subject to existing local regulations pertaining to the handling and dispensing of bulk foods the industry was most willing to participate in developing comprehensive rules affecting their particular business. Design and sales officials flew to Los Angeles from several parts of the country and almost every type of machine was sent to a meeting headquarters provided by the industry. After we examined and reviewed the sanitation features of each machine with the representative of its manufacturer, the entire group sat down around the table with Health Department representatives and amicably arrived at regulations which they recommended to the Board of Health Commissioners. We are glad that the National Sanitation Foundation, through its clinics, subsequently provided a means of conducting industry-health meetings to provide information that may be used as a basis for nation-wide standards.

A few weeks ago the Chairman of our Food Sanitation Advisory Committee closed the committee meeting with the following comment:

"I attended the meeting of the Board of Directors of the National Restaurant Association at Chicago in August. We had a conference of the Restaurant Association Secretaries from all over the United States. I had the opportunity to tell them about our Food Sanitation Advisory Committee and what has been accomplished. I could tell from the expressions on the faces of those present that there was great doubt in their minds as to the truth of what I was saying. Apparently this Committee is the only one of its kind in the entire United States. I have since had several communications from secretaries throughout the country asking for our plan of formation . . . how we operate . . . and what we do.

"There is no problem that can't be settled around a table if there is a 'meeting of minds.' This committee has proved that it can be done.

"We have again proved to this community that we are forward looking enough to try to bring together the elements necessary to accomplish proper sanitation; that is the people who work in the establishments, the owners

and the health departments. I told these two groups that the time has passed when the health departments felt they were a police agency . . . that they have come to recognize the fact that they are an educational institution whose job it is to make people understand that sanitation is a 'way of life.' You know, Walter Snyder hit the nail right on the head when he said 'Sanitation is a Way of Life.' Sanitation is not just the job of these industries—it is the job of everyone who lives in a given community. Therefore it becomes a problem of the whole community and not just of industries or health departments."

Close coöperation with the large number of groups who are anxious to participate in sanitation programs takes considerable time and energy. Our program would not have been possible without the Training and Investigation Division, created through funds, provided indirectly by health permit fee increases approved by the food industries. T. Ross Williams is Director of the division. Sanitarians of the division have the following responsibilities: training new employees; organizing inservice sanitarian training programs and supervisors' seminars; conducting and arranging industry training programs; preparing visual aids including moving pictures; providing secretarial services and guidance for the various committees and subcommittees; preparing a mimeographed monthly publication, *Sanitation Notes*, for distribution to industry and labor; preparing sanitation pamphlets and other literature, including foreign language translations; conducting tests and examining materials and equipment.

Practical public relations in a local sanitation program makes the work more pleasant for health department employees and for affected businessmen, industrialists, and individuals. Regulations developed after careful thought, study, and consideration need not be considered purely from the viewpoint of legal enforcement. They become standards or a guide for industry and health officials. Such regulations can be considered the framework of an educational program, not only in formal training institutes but during inspection visits. Through general community health education programs the public should be informed of their responsibilities; of what industry and health officials are accomplishing. If these objectives can be attained, sanitation personnel can take on the role of consultants rather than enforcement officers. The national sanitation program will get a big lift when sanitation personnel are considered part of "an educational institution whose job it is to make people understand that 'Sanitation is a Way of Life.'"

The Government in Industrial Health*

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THERE should be a note of triumph in our minds today as we commemorate the 35th anniversary of the Industrial Hygiene Section of the American Public Health Association. The establishment of the Office of Industrial Hygiene and Sanitation in the U. S. Public Health Service also dates back to 1914; so we can celebrate this 35th anniversary together.

There is real cause for celebration, because industrial hygienists have come a long way in that time. We not only had humble beginnings but also experienced hostile reactions when we tried to promote our programs. (We were about as welcome in some plants as a federal revenue agent is in the hills of certain southeastern states!) And this, despite the fact that men were dying of silicosis, lead poisoning, and other occupational diseases. It was the dogged persistence of government agencies that finally overcame this resistance.

Today, of course, the pendulum has swung in the opposite direction. Whenever an industrial hygiene survey is undertaken, there is complete, wholehearted support from management and labor. In fact, both of these groups are increasingly taking the initiative and coming to us for assistance in solving industrial hygiene problems. Previous apathy and downright rejection have been generally replaced by an enlightened understanding of the importance of industrial hygiene. This is a glowing tribute to the record of the industrial hygienist, as he looks back upon 35 years of uphill work.

As the official agency of the federal government, charged with the promotion of industrial hygiene, the Public Health Service shares your pleasure at this record and would like to take a backward look with you. The story of governmental activity in the industrial hygiene field has been told many times and is not new to you. But because of the occasion, it may be fitting to recite a few brief highlights of past work, as well as to trace plans for what we hope will be a vigorous future.

BEGINNINGS

In our traditional form of democracy, we believe that government is an instrument of, for, and by the people. Governmental institutions usually are called into or out of existence as the direct result of electoral mandate. Most programs spring into being only when changing events have brought about a distinct need for them. Such was the case with industrial hygiene.

Interest in industrial hygiene received its major boost when state compensation laws prompted American industry to seek ways of cutting down compensation costs. In response to the signs of the times, the U. S. Public Health Service, in coöperation with the Bureau of Mines, in 1913 undertook the first intensive study of the health of workers employed in the dusty trades and of the hazards to which they were exposed. This study pointed up the gravity of the occupational disease problem and paved

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the way for the establishment of an Office of Industrial Hygiene and Sanitation in the Scientific Research Division of the Service in the next year.

A pattern of research into the materials and processses used in American industry and their effects on the health of workers was developed by the office, and the first report published was the result of a study of vocational diseases in the garment industry. Then came studies of tuberculosis among zinc miners, lead poisoning in the pottery trades, hazards in brass foundries, mercurialism in the hatters' fur cutting industry and the felt hat industry, and additional studies of the dusty trades—the granite, cement, and clay industries, the mining industries, and others. The pioneer work which this office did in the field of occupational morbidity and mortality studies, and in the pneumoconioses, has provided the fundamental data which are being used the world over today. As hazards were discovered, engineers designed control devices or looked for substitute methods to eliminate the use of hazardous materials or processes. Later on, the various skin hazards in industry were studied.

During these years there was built up a huge reservoir of scientific data, knowledge which would be invaluable to industry. But this information lay virtually untapped because there were inadequate outlets to distribute it throughout the country. Until 1936, only 6 states had official agencies which carried on some form of industrial health activity. The passage of the Social Security Act in that year provided the funds which finally enabled the Office of Industrial Hygiene and Sanitation to encourage the initiation of industrial hygiene programs in state and local areas. Stimulated and assisted by these grants-in-aid, the state and local health departments gradually developed industrial hygiene units, until today there is at least one in nearly every state.

The Division of Industrial Hygiene, into which the old Office of Industrial Hygiene and Sanitation evolved, has continued to promote and aid in developing state and local industrial hygiene programs. Through continuous research and the combined field work of the various types of professional personnel, the division also discharges its responsibility of developing methods to protect the health of workers and to help them achieve the best physical and mental conditions possible. The adoption of these methods in industry is promoted so that the worker may benefit from scientific advances. The scope and content of industrial hygiene work has broadened considerably in the last two decades. Governmental personnel engaged in this work in 1913 included only the medical, engineering, and chemical professions. Today the services of physicians, dentists, nurses, engineers, physicists, chemists, laboratory technicians, statisticians, and others are required to keep the health of the worker at the highest possible level. Funds spent by the states for industrial hygiene work have trebled in the past 10 years, indicating a widening range of activity.

The chief contribution of the federal government has been the development of the know-how and leadership in a highly complicated and technical field and of a nation-wide network of industrial hygiene units. Direct responsibility for protecting the health of the worker, however, rests with these state and local industrial hygiene units, of which there are 58 at present. These agencies employ approximately 400 professional personnel.

Most of the field activities of the state and local industrial hygiene units are devoted to routine investigations and evaluations of environmental health hazards and recommendations for their control. The services also include medical evaluations of industrial diseases and improvement of in-plant health pro-

grams. Last year, these agencies reported 37,336 different services to 25,700 industrial establishments, covering almost 6 million workers.

In addition to direct industrial hygiene services, these units bring to industry more or less complete health programs by integrating their work with that of other divisions in the state government, such as sanitation, venereal disease control, and tuberculosis control. They maintain coöperative working relationships with other state agencies, unofficial health groups, and professional organizations. Their programs are integrated with that of the Division of Industrial Hygiene of the Public Health Service through such activities as consultative services on administrative and technical phases of programs, the application of standard practices, and the conduct of research field studies.

These offices have done more than a commendable job with their small staffs, but the limited coverage which they have been able to achieve means that, at present, 90 per cent of the entire labor force receives no service from an official agency in any one year. This is all the more serious when we consider that over 90 per cent of the industrial plants in this country employ less than 100 workers, and that the vast majority of these small plants do not even have the most elementary industrial health services. Some even lack a cigar box first aid kit, however primitive that may be and however much it may leave to be desired. As we advance toward other anniversaries, we can see therefore that one of the big problems still confronting us is the need to extend industrial hygiene services.

Throughout the history of our work in the industrial hygiene field, we have enjoyed the coöperation of other governmental agencies. The Bureau of Mines, for instance, at its central station in Pittsburgh, Pa., has been carrying on research since 1920 on substances used in mining and allied industries and on the control of underground exposures. This work has been performed in collaboration with our division. The Bureau of Mines has also developed, and is conducting, an approval system for respiratory apparatus which has greatly influenced the raising of standards of equipment of that character.

As another example of coöperative relationships, we have recently conducted inter-agency studies on health and welfare plans under collective bargaining in coöperation with the U. S. Department of Labor and the Social Security Administration.

To facilitate working relationships and to avoid duplication of effort, agreements have been put into effect between the Public Health Service and the Bureau of Mines, and are being renewed with the U. S. Department of Labor, to delineate responsibilities. The Public Health Service has encouraged the development of similar agreements among state agencies.

Our relationships with many of the other federal agencies are mainly in the nature of direct service to them. Lighting conditions have frequently been studied, for instance, as were also outbreaks of dermatitis at government mints. During the war we coöperated with the armed forces in protecting the health of workers engaged in war production. We still keep abreast on industrial health implications of new defense developments.

The state and local industrial hygiene units scattered throughout the country are tied in even more closely with the work of this division through the American Conference of Governmental Industrial Hygienists. This group is composed of individuals engaged in industrial hygiene work for the federal, state, or local governments. Formed in 1937, the organization seeks to promote industrial hygiene in all its aspects and to coördinate such activities at all official levels.

It has been instrumental in encouraging the interchange of experience among industrial hygienists and, through its standing committees, has solved some knotty problems as well as helped to smooth administrative operations. Some of the activity of these committees has been the development of industrial health codes and of a standard system of reporting official industrial hygiene activities.

Much good has accrued from coöperative efforts with nonofficial groups, such as the Council on Industrial Health of the American Medical Association. Last year, for instance, this division and the council co-sponsored the Ninth Annual Congress on Industrial Health. Whenever possible, the division draws upon other professional and industrial organizations, as well as voluntary health groups, in the interest of bringing a comprehensive, all-round health program to the worker.

PRESENT AND FUTURE PROGRAMS

Thus far I have reviewed the past of official industrial hygiene activities. Now let us take a brief look at the future. Each year we find that industrial hygiene is assuming greater stature and importance on the public health stage. This implies a weight of responsibility on us as industrial hygienists and a need to call upon various other interested groups for broad policy guidance. In recognition of this need, the Public Health Service recently appointed an Advisory Committee to the Division of Industrial Hygiene. The ten members of the committee bring together the viewpoints of management, labor, the health professions, and state health and labor departments.

One of the problems brought before the Advisory Committee at its first meeting in September was the question of air pollution. This is a problem which looms large in the mind of the general public as well as of the industrial hygienist. In Los Angeles, the severe irritation of the eyes and nasal passages of residents has given us sufficient hints that smog may have public health implications. The Donora incident, in which 20 persons lost their lives, and more than 5,000 were made ill, last fall, gave conclusive evidence of the grim potentialities of smog. We can no longer think of air pollution solely in terms of a nuisance.

The most comprehensive data compiled to date on the effects of atmospheric pollution on human beings are presented in the report on the Donora incident, just issued by the Division of Industrial Hygiene. The report provides industrial hygienists with a large body of fundamental knowledge, based on clinical, environmental, and meteorological investigations. It is hoped that these findings will facilitate other studies and help to solve what are still unanswered questions.

The division is also training its research efforts on another sector of industrial hygiene in which many questions have mushroomed in recent years—the field of chemical insecticides. We know how to control the hazards associated with lead, arsenic, copper, and the fluorides, which bulked large in our agricultural picture until the last decade. Now, however, we are confronted by an entirely different group of insecticides, much more virulent than their predecessors. As yet, there is some knowledge of the toxicity of only a very few of these potent insecticides, which include parathion, chlordane, 2-4D, organic mercury compounds, methyl bromide, benzene hexachloride, DDT, toxaphene, and tetraethylpyrophosphate. Additional basic research is needed. Close liaison between public health agencies, agricultural agencies, and chemical manufacturers and distributors will not only foster the helpful exchange of data, but will also promote the funneling of information down to the industrial worker and the

farmer, for whom it is intended. Such coöperative relationships may also be established by industrial hygienists at state and local levels to good advantage.

The field of radiant energy is daily presenting new facets which demand the attention of the Division of Industrial Hygiene, in addition to other sections of the Public Health Service. Only last month, for example, in response to a request from the State Health Department, the division sent a consultant to Colorado for a preliminary exploration of health hazards associated with the mining and milling of uranium. There have been indications that this element may be chemically toxic, as well as presenting potential radioactivity hazards to workers exposed to it. Although the number of workers engaged in such operations at this time is 2,000, it will doubtless be increased as atomic energy receives greater emphasis and as more uranium compounds are developed. Any knowledge gained from such a study would therefore prove invaluable for future expansion of atomic operations. Consultant service on radiant energy has also been given to state industrial hygiene units through film badge readings and other technical assistance. Training courses in the measurement of ionizing radiations have been held, also, for state personnel.

These expanding activities have severely taxed our limited laboratory facilities. In order to avail itself of more spacious laboratories, the division is transferring its engineering and laboratory operations to Cincinnati. Quarters are being made available to us in a building in which the Environmental Health Center of the Public Health Service is already housed. The move to Cincinnati is in line with Public Health Service policy of concentrating all environmental research activities in that city. It is expected that these new facilities will enable us to undertake more work and to complete it more expeditiously. Also, with both field and laboratory personnel working in one building, smoother team work will be possible.

Another action was recently taken in the interest of better service to state and local industrial hygiene units. A field station was set up at the University of Utah at Salt Lake City to give engineering and laboratory help to western states. This location will also make it possible for graduate students in industrial hygiene research to use the field station's laboratories. It will also allow the station's staff members to assist the university in presenting industrial hygiene subjects to graduate and undergraduate students. As soon as possible, the work of the station will be expanded to give consultation on industrial medicine and nursing care.

Another important project on which we are embarking is the collection and analysis of reports on occupational diseases. The Division of Industrial Hygiene is stepping into the role of central collection agency because of the absence of any systematic scheme for reporting occupational diseases on a national scale. This is one of the problems which were put before the newly established Advisory Committee to the division at its meeting last month, and the group unanimously endorsed the project.

We shall look for your coöperation in this undertaking because we feel that it will be of benefit to all. Information of this kind will bring some long needed insight into the incidence of occupational disease on a national scale, as well as in specific industries and occupations, and into those conditions indicating further study and research for the control of such diseases.

The division has also recently extended its activities on industrial medical programs. The primary objectives of this expansion are to assemble and interpret authoritative information on various aspects of medical care for industrial

workers and, upon request, to provide information and consultation services on these subjects to state and local industrial hygiene agencies, management, and labor. Extensive coöperation with governmental and non-governmental agencies is contemplated for both the research and the technical services.

Realizing the importance of disseminating information, we are going forward on a more vigorous information program. In exploring all media, we have recently launched a film project which we hope will be an invaluable adjunct to the overall information program.

I have tried to outline briefly the major problems confronting us and the steps we are taking to cope with them. That the bulk of industrial hygiene work lies ahead is self-evident because of the nature of American technology. And an additional force, along with Government itself, has recently become more vocal on the need for increased industrial hygiene work. The American worker is today more informed and more articulate about health matters. He demands recognition as part of the industrial hygiene tripod, along with management and official agencies. Labor wants health programs, but it also wants to have a voice in the planning and development of those programs. The worker today is putting health on a positive rather than a negative basis. He not only demands protection but also expects wholesome working conditions which will enable him to reach a healthy old age. This frame of mind is reflected in the increasing emphasis on health and welfare clauses in bargaining contracts.

I believe this is the most important factor which has made itself evident during the past year. With the sudden upsurge in interest in all of these programs—such as air pollution, medical care plans, occupational diseases, and all the rest—we are no longer in the position of having to sell ourselves. We now find ourselves in the opposite position—that of receiving demands for service, research, and consultation. In air pollution, for instance, whether we want to be or not, we are now in the field in solid fashion. The same goes with other programs. Now it is up to us to do the job.

Industrial hygiene activity is far from reaching a plateau. The period of greatest productivity lies ahead, and an upward course must be plotted on the progress chart. I shall hope to be present at another anniversary celebration of the Industrial Hygiene Section of the American Public Health Association when further notable progress will be chronicled.

Teaching of Mental Hygiene for Graduate Students in Public Health*

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A PRIMARY objective of the teaching of public health is to assist in the preparation of professional personnel for leadership in education, in research, and in service. The qualifications and skill of these students are influenced by judgment, knowledge, and viewpoint, not by "drill methods," for operation on a teamwork basis, in the development and execution of soundly conceived programs for individual and community health. Fortunately, methods of teaching have not been standardized although essential principles have been developed and the accredited schools of public health compare experiences periodically.

Mental health and total health are inseparable. Emotional factors are present in the majority of physical illnesses and may be important in treatment. On any one day, the mentally ill constitute about half of all patients in hospitals in the United States. Many other cases are seen in private doctors' offices and in clinics. Psychological factors are important in adjustment to physical handicaps, in convalescence, and in rehabilitation.

Some graduate students in public health will wish to major in mental hygiene, while others take advanced work in maternal and child health, in nursing, in occupational health, and in hospital and medical care administration. All students, however, will wish to obtain a viewpoint of public health as a whole.

The chief responsibility for the prevention of mental ill health, according to reports from the National Health Assembly [1] lies primarily with the public at large, not with the psychiatrist. In short, "clergymen, teachers, lawyers, social workers, nurses, recreation and group workers, law enforcement officers, public health personnel, representatives of management and labor, and many others are constantly presented with opportunities for recognizing emotional problems." It is essential, then, to provide an opportunity for all graduate students in public health to have at least some orientation in mental hygiene, in order that they may understand the community problems and opportunities, and be competent to work effectively with consultants and their professional associates who are more intimately identified with responsibilities and services in psychiatry and mental hygiene. All students and faculty members need this background of experience and understanding; but there is no single pattern for the attainment of the objective.

The topics illustrating factors to be covered in the preparation of students and future staff members can be divided into five categories, although the methods and the content of instruction

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will vary depending upon the groups and the individual needs:

1. Personal relations in an organization, department, or agency
2. The personality problems of physical illnesses
3. Mental hygiene as public health education
4. Personality disturbances as public health phenomena
5. A public health approach to mental illness

1. *Personal relations in public health organizations*—Sometimes we need to understand ourselves better and also to understand each other better, regardless of whether we are university teachers or health administrators. Our concern with public health objectives and administrative routines tends to make us forget that our community organizations consist of people, not units with particular technical qualifications. The personal consequences of our administrative practices and the need for friendly relations in our organizations require attention. Industry and the military establishments have given more attention to the problem of fostering personal concern and integration than have some public health units. Members of college faculties, teachers in school systems, and staff members of the health department and other agencies can derive benefit from a constructive approach to these opportunities.

Through our general public health seminars, in which all students and faculty participate, and through other seminars devoted specifically to mental hygiene in relation to public and personal health, led by a psychitarist, who has interest and understanding in community affairs, *the foundation is laid.* In addition, a public health psychiatrist staff member at Yale participates in sessions of the "Core Program"* along with specialists in nursing, social service, sanitation, and medical administration, for example, besides serving as a consultant for staff and students in other projects. Studies conducted in clinics and elsewhere in coöperation with other staff members and with community health agencies provide useful experiences and data for practical discussions. Also, graduate students in psychiatric nursing are given a basic course in community health as a part of their training.

2. *Personality problems of physical illness*—A growing proportion of public health work brings the professional personnel into contact with individuals and groups suffering from disease or incapacity. Venereal disease programs, tuberculosis programs, and cancer control programs, among others, bring health educators, public health physicians, and nurses into direct relationship with people suffering from these conditions. There is increasing opportunity to work with families in which diabetes and cardiac diseases are of major concern.

All of our personnel must learn something of the physician's art of listening, of understanding human beings in distress. The needs of some people to exaggerate their illness and the needs of others to minimize theirs must be considered and understood, and tolerated by our workers, whether their contact with the individuals is in connection with a personal investigation, a plan for rehabilitation, an attempt to bring an infectious individual under treatment, or simply in the verifying of the report of a case. Even the clerks handling records and statistics often come into contact with individuals recently bereaved. Certainly those in supervisory and administrative positions should be aware of the many factors and responsibilities. And while no one wishes to be ill, there are times when illness and invalidism are a solution for an individual's personal or social problem. Useful information on these subjects is given in Lemkau's recent book *Mental Health.*[2]

* Besides foundation courses, elective and advanced courses, including basic issues in education and special work in growth and development coöperating with other schools and departments.

We are exploring methods of instruction and service as a part of our training program. For example, we try to develop some understanding of these problems by having our classes, which include candidates for all degrees, participate in clinical case conferences. Under the supervision of a social worker, and with the help of a psychiatrist, as one procedure, the students work up and present from the records, from personal interviews, and appropriate home visits, the relevant facts about individual cases in the hospital. In the ensuing discussion, not only are the administrative relations of the various agencies clarified, as well as the relationship between the various professional personnel (including the psychiatrist, psychologist, and psychiatric social worker), but the forces which help to produce the patient's illness and his reaction to the illnes are outlined. These sessions and observations in clinics and elsewhere provide subject material for both formal and informal discussion within the group of representatives of the student "public health team."

3. *Public health education and mental hygiene*—The mental hygiene movement has been centered on the promotion of more healthy personalities, on the dissemination of knowledge and understanding about delinquency, crime, marriage and divorce, sickness and health, mental illness and mental health. Perhaps it has affected the school system and the pediatricians and social workers more strongly. But educational activities for mental health are also a public health function. Sometimes the school health physician and the nurse who works with him are less well informed on mental health principles than the teachers they are supposed to advise. Sometimes the problems are due to the emotional instability of the teachers or of parents. The public health physician, the nurse, and the dentist who work in a maternal and child health program require special knowledge concerning both normal and abnormal emotional development of children, and much about the psychology of pregnancy and motherhood.

Health educators are involved in the dissemination of information and understanding regarding many diseases of public health importance. They need to think in terms of the concepts of disease they may be creating, the attitudes toward diseases and illness they are producing, and in terms of the motives appealed to, while helping to instill in every man, woman, and child the desire to attain and maintain his own well-being.[3] A member of the Berkeley Experiment remarked: "Even if we can't always cure anxiety, we can cut down on our own creation of it. I think the best method of teaching the staff," he said, "will be the case study method or conference, whether it be a child behavior problem, a difficult restaurant owner, or whatever."[4]

4. *Personality disturbances as a public health phenomenon*—

a. Mental illnesses in themselves deserve emphasis, with some consideration of the relative numbers of psychotic patients. Schizophrenia commitment rates, manic depressive psychosis commitment rates, the magnitude of selective service rejections for personality disorders, and Army discharge rates are illustrative subjects. These figures indicate that mental illnesses constitute an enormous problem of public health concern. Professional workers in the public health field must become familiar with the diseases involved, and help to solve the problem of disease control and of medical care programs.
b. Mental illness, secondary to brain damage, is another topic. For example, the psychosis associated with cerebral arteriosclerosis and senile brain changes.
c. Physical diseases caused by personality disturbances.
d. Physical diseases caused by other factors.
   (1) *Psychosomatic affections*—A not entirely clear group which plays a role in ulcers, hypertension, perhaps in other areas. Epidemiologists,

familiar with these syndromes, can make studies and should be aware of the enormous potentialities for research in this group of diseases.

(2) *Accidents*—The fact that the majority of accidents occur to a relatively small proportion of the population shows that there are important host factors in this major cause of death and injury. Psychiatrists have recently made valuable discoveries regarding the personality characteristics of those prone to have accidents. An accident control program is a necessary part of every public health program, and the day is not far off when health officials, including health educators, will be given responsibility for developing methods of isolating the susceptible host from the hazard and for raising the host's resistance to accidents.

5. *A Public health approach to mental illness*—The deans of the schools of public health recognize that they have a responsibility for training the different professional health workers in the principles and methods of mental health procedures as developed by psychiatric study and by other methods. They are aware also of their responsibilities for helping to develop public health programs for the control of mental disorders.

Illustrative studies have followed such lines as:

a. Epidemiology of mental disorders. Satisfactory studies in this field require the cooperation of public health personnel who are familiar with the types of problems involved. Our ignorance regarding the epidemiology of mental disorders is great. We do not even know:

(1) Whether the various mental disorders are exhibiting an upward, downward, or level trend in their incidence, as distinguished from the numbers of committed cases.

(2) What are the explanations of the varied rates observed in different communities? Do they represent simply a difference in commitment rates, or a difference in incidence?

b. Programs for medical care in modern society embrace psychiatric care, including first aid for the mentally injured. Psychiatric care cannot be isolated from other medical care. If the administrators of medical care plans and of hospital care plans are not oriented on the problems of rendering psychiatric care, they will tend to continue the isolation from which mental health services have also suffered in the past.

In the teaching of public health and mental hygiene and in studies we may keep well informed. "The mutual dependence of man is so great in all societies that scarce any human action is entirely complete in itself, or is performed without some reference to the action of others." [5]

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Voluntary Health Insurance on the National Scene

The United Mine Workers Health Program *

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THE PROBLEM

IN the latter part of 1948, when a medical program for the United Mine Workers became possible through the Welfare and Retirement Fund, there were two main groups of individuals who had to be considered—one comprising an accumulated backlog of many thousands of miners and their dependents whose condition had gone from bad to worse because of inadequate care or none at all, and the other consisting of some 400,000 working miners and their dependents, for whom better and more extensive health and medical services were a pressing need.

Facts and figures regarding health conditions gathered by the United Mine Workers over a period of many years, together with the *Medical Survey of the Bituminous Coal Industry* conducted by Rear Admiral Joel T. Boone and his associates in 1946–1947,† provided authentic information regarding the conditions with which a health and medical program would be faced. Some of these facts were as follows:

The United States death rate from all causes for 1946 was 10.0 per 1,000. For coal miners it was 15.1.

The average age at death of miners for whom death benefits had been paid was 55.8 years as compared with 64.2 years, which was the average age at death for the population as a whole.

The number of miners killed from all causes annually from 1906 to 1945 averaged 1,981, which means that for every working day at least 5 men were killed. The total for the period was 79,240.

The number of miners injured each year during the 14 year period 1930–1944 averaged 66,968.

From 1944 to 1948, an additional 234,923 men have been killed or injured in the mines.

It is significant to note that even during the first 6 months of 1949, when working days were curtailed to some extent and the annual vacation period was in effect, deaths in the bituminous mines were as follows: January, 65; February, 44; March, 45; April, 50; May, 46; June, 41.

Complete and accurate data regarding the incidence of disease among coal miners and their dependents were not available. With the woeful lack of public health measures and medical service which prevails in many mining communities, however, it could scarcely be conceived that the prevalence would not be high. Studies of infant mortality rates in certain counties where mines

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† U. S. Department of the Interior. U. S. Gov. Ptg. Office, Washington, D. C., 1947.

were surveyed showed a significantly higher rate than in non-coal mining counties. In medical certifications for disability benefits, tuberculosis, pneumonia, "miners' asthma" or silicosis, together with arthritis and rheumatism, played an enormous role.

The best hospitalization and general medical care plans that had been observed did not provide all-inclusive medical service and contained so many limitations that provision for all major illnesses was not possible.

About 70 per cent of the miners and their families received their medical services through prepayment plans of one sort or another. The administration and operation through some of the larger companies were outstanding but at a majority of the mines the services ranged from adequate to very poor. Practitioners were overburdened and at a number of places there was a tendency to give more consideration to profits than to the quality of medical care. Poorly qualified physicians and others not properly licensed were receiving large sums through deductions from the wages of the men. In one instance, a druggist with no medical training whatever was practising medicine in an isolated community and receiving a share of the payroll check-off along with two qualified physicians.

All in all, it will not be surprising to hear that life insurance rates for miners are 277 per cent higher than for workers in non-hazardous industries and are of course prohibitive.

No program for the rehabilitation of disabled miners of the soft coal industry was in existence. Some 400 miners with broken backs, paralyzed from the waist down, were bedridden, helpless and forgotten in their hillside cabins, their workmen's compensation exhausted, eking out an existence of indescribable misery and torture with no prospect in the world of anything more than an agonizing death.

Such were some of the conditions that had to be faced and on which immediate action was necessary.

THE PLAN

At the Convention of the United Mine Workers at Cincinnati in October, 1948, President Lewis advised the members as follows:

> It will be the purpose of the Fund to work toward the objectives of providing for the members of our organization in all Districts and in all Local Unions a prepaid form of hospital service and medical attention. Arrangements will be made for the utilization of present hospital facilities under contract forms which will guarantee the standards of service, and the same will be true with the medical profession. When these facilities are established in a given District, it will mean that the expense will be paid by the United Mine Workers Welfare and Retirement Fund, and free our membership from paying a monthly amount deducted from their wages—so much a month to the hospital and so much a month to the doctor.
>
> It may be that down through the years experience will demonstrate the necessity of providing additional and more specialized facilities for the needs of our people. But that will come through experience and the availability of funds.

In pursuance of this policy, it was obvious that the first step in providing immediate services was to arrive at satisfactory terms with the physicians and the hospitals. The stated objective was to secure for our people a good quality of medical and hospital care at as reasonable a cost as could be attained.

The hundreds of thousands of mine workers and their families were distributed in communities of varying character in 22 states, extending from Pennsylvania in the east to the State of Washington in the west and to Alabama in the south. To conduct the work throughout this extensive area, 10 Area Medical Offices were established at locations selected with reference to the numbers in the mining population to be served, medical and hospital facilities

available, and accessibility to the mining centers. The places chosen were Beckley, Charleston, and Morgantown, W. Va.; Johnstown and Pittsburgh, Pa.; Knoxville, Tenn.; Louisville, Ky.; Birmingham, Ala.; St. Louis, Mo.; and Denver, Colo.

A physician trained and experienced in organization and administrative work was placed in charge of each office, with the title Area Medical Administrator, U. M. W. A. Welfare and Retirement Fund. Provisions were made for a staff adapted to his needs. The Area Medical Administrators are responsible to the Executive Medical Officer at the headquarters of the Fund at Washington, D. C. He in turn is responsible to the Director of the Fund, who carries out the policies determined by the Board of Trustees. The Board of Trustees is appointed in accordance with contractual agreements between the United Mine Workers and the operators.

The functions of the field offices are well described in the words of one of the Area Medical Administrators, as follows:

1. Specifically to arrange for a high quality of medical and hospital care for members of the United Mine Workers of America.
2. To arrange for free choice of physician and hospital and concomitantly free choice of patient.
3. To utilize for the benefit of the United Mine Workers all of the health services made available by other organizations in the state and country.
4. To develop rehabilitative services for disabled miners.
5. To perform this service with a minimum of administrative detail and cost.
6. To provide a leadership which will direct the impact of the program into channels that will stimulate the highest quality of medical service, both for miners and for other members of their community at the most reasonable costs.

The inauguration and extension of the program were planned in four stages.

First, came hospitalization and medical care in the hospital for members receiving grants from the Fund in the form of pensions, or disability benefits because of injury or disease which prevented them from working in the mines. Their dependents were included. As such grants are sufficient only for the bare necessities of life, these people were without means to pay for hospitalization and related professional services. It was recognized also that the experience gained in working out arrangements with physicians, hospitals, union officials, and the miners themselves would be extremely useful as the services were extended later on.

Second, was the provision of home and office care, including drugs on a physician's prescription, for the same group of people. It was anticipated that this stage could not be long delayed because of the numerous cases in which discharge from the hospital would not be advisable unless outside medical care could also be provided. It was obvious that otherwise hospitalization would be required for numbers of persons who could be adequately cared for by home and office visits.

Third, was the extension of hospital care and medical care in the hospital to all working miners and their dependents. This of course meant coverage of hundreds of thousands of persons, the number of whose applications could not be told in advance.

Fourth, was the development of a program of public health and preventive medicine in coöperation with existing agencies, to correct the serious deficiencies and improve the deplorable living conditions which the *Medical Survey of the Bituminous Coal Industry* revealed in a majority of the coal mining communities.

The first three stages have been in operation. The fourth is just beginning.

Operating procedure may be outlined briefly as follows:

The Area Medical Administrators arrange with individual physicians, hospitals, and drug stores within their respective areas to provide services to

beneficiaries of the Fund upon presentation of accepted forms of identification.

Physicians must be in good professional standing and acceptable to the union members. They must indicate their willingness to render services in accordance with operating procedures established by the Fund and at reasonable charge. In determining a reasonable charge, they are asked to consider the following: (1) payment satisfactory to the physician will be made for every patient cared for (many beneficiaries could have paid nothing for themselves, and others could have paid only part of the usual fee); (2) payment will be reasonably prompt; (3) paper work will be kept at an irreducible minimum; (4) free enterprise and competition will be insured by the right of the patient to go to the physician of his choice and the right of the Fund to discontinue services of physicians whose charges are excessive as compared with similar services by others of equal standing.

The names of physicians, including specialists in all fields of medicine, who indicate their desire to participate under these conditions are placed on a local list which serves to inform the beneficiaries to whom they may apply for treatment.

Physicians may refer cases to any other physicians on the local list for specialist services.

When the specialist care essential in the best interest of the patient is not available from physicians on local lists, the Area Medical Administrators may arrange for the services of the specialists required, wherever they may be located.

Dental and optical services are limited for the time being to persons whom the physician believes require these services in the treatment of a specific illness.

Hospitals must agree to provide the best services they are capable of rendering. Unfortunately, satisfactory standards do not prevail in some institutions and the decision must then be made as to whether to deal with them on a restricted basis and make intensive efforts to bring about improvements as rapidly as possible to make them more nearly acceptable. Progress in this direction is being made. As far as possible, the Reimbursable Cost Formula is the basis used in determining rates.

Lists of the hospitals with which agreements are made are sent to participating physicians and to the local unions.

Members and their families who are recipients of grants from the Fund may receive prescribed drugs and medical requisites. Drugs are limited to those listed in the *U. S. Pharmacopeia, New and Non-Official Remedies,* or *National Formulary,* and new drugs accepted for inclusion in *New and Non-Official Remedies.* Arrangements are made with conveniently located drug stores to fill prescriptions presented by members with proper identification and to bill the Fund at reasonable rates.

Lists of the drug stores with which agreements are made are sent to participating physicians and local unions.

Comparable arrangements are made with vendors of orthopedic and other appliances.

Bills are reviewed in the Area Medical Offices and forwarded to the Washington office for audit and payment.

A member receiving a grant from the Fund and in need of medical care is given the following instructions:

1. Select a doctor from the list available at your local union.
2. Go to the doctor you select and present your identification form.
3. Medicine prescribed by the doctor may be obtained from any drug store listed at your local union.
4. If you need hospital care the doctor will give you a note to your local union which will issue a Hospitalization Slip.
5. Take the note from your doctor and the slip from your local union to one of the hospitals listed at your local union.

Arrangements are made with the State

Offices of Vocational Rehabilitation to provide services for patients who can benefit by them, either during or after their hospital treatment.

A Medical Advisory Board of the Welfare and Retirement Fund, with Dr. R. R. Sayers as Chairman, was appointed in September, 1947. It consists of 10 members of recognized authority in the fields of medicine and public health. Called meetings are held at which the members are requested for advice as to administrative procedures and technical problems encountered. The program which has been adopted is in accordance with principles viewed as sound by the members of this board.

PROGRESS

About 6 months prior to the adoption of the Medical, Health, and Hospital Program as outlined, the Fund, through Dr. Sayers and his associates, undertook to locate and hospitalize a number of its beneficiaries who were in most desperate need of immediate attention. Among them was a large proportion of paraplegics paralyzed from the waist down from spinal injuries and broken backs. Some had been in this condition for as long as 30 years; others for lesser periods of time down to recent months. They had received whatever care was afforded at the time of their injuries but had long since been forgotten and given up to die. The condition of most was so frightful that leading medical centers to which they were transported for treatment stated that they had never before been confronted with such problems, and were compelled to organize teams of specialists and devise new techniques for salvaging the remaining tissues of these diseased and wasted bodies.

The institutions that could undertake the intensive care that such seriously diseased and injured persons required over a period of many months were practically nonexistent. Every facility that could be adapted to the job was utilized and others were developed. Approximately 200 of these patients were sent across the continent to two medical centers in California in chartered cars with physicians and nurses in attendance. Arrangements were made with hospitals at frequent intervals en route to which patients could be removed, should emergency need arise.

A total of 496 cases of this type have either been discharged from the centers or are still under treatment. Their transition from helpless, bedridden, literally rotting creatures to men in wheel chairs and on crutches and artificial limbs is one of the most dramatic stories in medical history, and a monument to the physicians and institutions who undertook this seemingly hopeless task.

The experience with these and other special cases was extremely useful in the program which followed, inasmuch as it gained the confidence of the union members in the ability of the Fund to enlist the interest and coöperation of physicians and institutions of national renown in their medical problems. On the other hand, it produced an insight on the part of physicians and medical centers into the medical needs of the miners and their families, which did much to awaken a favorable response to the extension of the work.

As the general program has been developing, step by step, for less than a year, and is by no means yet complete, sufficient data for accurate appraisal of results have not accumulated. Impressions have been gained and trends have been observed which are summarized for what they may be worth at this beginning stage.

Some 6,500 physicians and 600 hospitals are already listed as participating in our program; also 1,287 drug stores. From January 1 to September 1, 1949, 39,000 persons were hospitalized and 375,000 days of hospital care were provided. A total of 180,000 home and office visits were made.

The response of the medical profession and the hospitals is excellent. In many instances liaison committees have been appointed by state and local medical societies to insure proper understanding and good working relationships with our Area Medical Offices. These committees have been of great assistance in matters pertaining to reasonable fees, maintenance of proper standards of medical care, eliminating bad practices, encouraging well qualified physicians to locate in mining areas where greatly needed, and the like.

Satisfactory relationships with the physicians throughout the extensive coal mining areas are due in no small part to the time devoted by the Area Medical Administrators in making direct personal contacts and in giving talks to medical societies on the objectives of the program and methods of procedure. Emphasis has been laid upon the responsibility of the profession to see that a good quality of service is rendered and for policing that service itself. The simplicity of the methods followed by the Fund in relation to paper work and the payment of bills has also aided in gaining support.

The matter of fees is in process of being resolved. The objective of the Fund to secure medical care of good quality at as reasonable cost as such quality could be provided under any system has been accepted without question. We may already rely upon outstanding members of the profession with whom we deal throughout the country for 100 per cent coöperation in this respect. They are cognizant of the medical problems of the miner and of the spirit in which a great union is approaching the medical profession and seeking its coöperation in a plan that holds promise of a high degree of satisfaction to both. They voluntarily determine the fees which they consider proper under the circumstances and their bills are received by us with the deepest sense of satisfaction and appreciation.

It would be too much to expect that there would not be marked deviations from what the majority of physicians feel is right and proper. Bills are submitted occasionally which are out of all proportion to what experience has shown might be expected. When this occurs, the physician is frequently willing to modify his charges when the facts are brought to his attention; otherwise it is assumed that he is not interested in receiving patients of the Fund and he is no longer bothered.

In general, it has been our experience that the fees which are excessive tend to occur with physicians who rarely receive our cases, or do so for the first time, or have little interest in continuing to serve our people. They therefore fail to note our purpose and the constructive interest of the profession which is supporting principles which they consider sound and hope will work. With sufficient time and the continued aid of the profession, we are confident that most of these difficulties can be overcome.

Careful records of cost are being maintained and will be made known as soon as the program has been in operation long enough to permit a fair appraisal. In the meantime, we shall carry on in the conviction that the terms which the medical profession considers just and proper in our particular circumstances will stand the test of any scrutiny that competent authority may ever have occasion to give.

While the Fund has avoided the establishment of a fee schedule, many medical societies and individual physicians have expressed a desire that acceptable fee schedules be arranged. One medical representative recently pointed out that it seemed unfortunate that the Veterans Fee Schedule could not be put to wider use, in view of all the energy that had been devoted to its development and acceptance. As far as we are

concerned, we are interested only in good service at fair cost. We are quite willing to leave it up to the profession as to how this may best be assured.

We are barely at the start of an extensive program of health and medical care with tremendous implications. Past experience has been utilized to the extent that it could be applied. Toward this end we have discussed our problems and our plans with groups and individuals of the highest standing in the fields of medical practice, industrial medicine, and public health. Without exception, we have received encouragement in going forward on the course as indicated. We have made mistakes and will doubtless continue to make them, but it is our constant endeavor to maintain a flexibility that will permit changes as experience reveals a better way.

In conclusion, may I quote again from a recent report of one of our area physicians who himself is on the firing line: "All in all the program is progessing with considerable success. It is wrapped into the hearts of the miners whom we serve. It is receiving excellent coöperation from the vendors of the huge medical services we are purchasing." And he might have added, it is building a better relationship between the miners and the physicians and the hospitals, and tending toward a better quality of service than ever existed before.

You are doubtless aware that the Board of Trustees has authorized a temporary suspension of payments, dating from September 17, 1949. May I quote from the Resolution as follows: "Suspension of payments by the Trustees is a temporary expedient, to continue until funds are available for resumption of benefit payments, at the discretion of the Trustees."

Regionalization of Medical Services in New England*

BROOKS RYDER, M.D.

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REGIONALIZATION in New England was first instituted as a formal program in 1936. At that time, appropriations were made available through the Bingham Associates Fund to be used for the broad objectives of increasing medical knowledge and improving standards of medical care. Subsequently, there has been developed a program of regionalization of medical services, known as the Bingham Associates Program. In so far as this regionalization is concerned with a closer coördination and coöperative association between widely scattered hospitals, the scheme or concept is familiar to all of you. A large teaching base hospital, in a metropolitan center and associated with a medical school, affiliated with regional or intermediate hospitals in distant communities, and these, in turn, working closely with smaller, affiliated community hospitals —this blueprint is familiar.

In New England, the base hospital is the New England Medical Center; the medical school is Tufts College Medical School. Regional hospitals are located in Lewiston, Me., Bangor, Me., and in Western Massachusetts. A total of nearly 40 hospitals is thus established in a voluntary coöperative association and, through the organization thus established, a two-way flow of personnel and services is facilitated.

Flowing centrally, from small, relatively isolated hospitals toward larger and more specialized institutions, come not only patients for complex diagnostic and therapeutic procedures, but also physicians, nurses, technicians, and other personnel who desire further training or refresher courses. Also flowing in a central direction are various services, such as electrocardiographs, pathological specimens, complex laboratory procedures, and x-ray films. Simultaneously, traveling in the opposite direction toward the smaller hospitals, are specialists and consultants for advice and assistance. The aim is always toward decentralization. The objective is *not* to encourage a constant stream of patients toward the teaching center, nor to by-pass the small hospital in medical care. Rather, the objective is to decentralize—to improve the ability of small hospitals to render the best medical care, to develop locally those ancillary services without which the rendering of adequate medical care is difficult, if not impossible.

Closest in this respect to the bull's eye of our target, namely, the patient-doctor relationship—are such ancillary services as laboratory work, radiology, electrocardiography, anesthesia, nursing, pathology, and related fields. Without these specialties, a hospital in the modern sense is no longer complete. Yet few small hospitals can attract or support full-time pathologists, radiologists, or cardiologists. The small community may have to look beyond its own boundaries to obtain their services. Through a system of decentralization, or regionalization,

* Presented before the Medical Care Section of the American Public Health Association at the Seventy-seventh Annual Meeting in New York, N. Y., October 25, 1949.

a nearby large hospital may be encouraged to assume a degree of responsibility toward its smaller neighbors. The second concentric ring in our target (the center of which is the patient and physician) embraces fields in the specialties of more efficient hospital management, accounting, purchasing, medical libraries, and medical records. Here, too, an association whereby hospitals may request advice from the specialists in administrative procedures from affiliated large institutions may indirectly make the practice of medicine more economical and efficient.

The fields in which the Bingham Associates Program stimulates and encourages such "centrifugal" help include pathology, radiology, electrocardiography, dietetics, postgraduate nursing education, medical records, accounting, purchasing, laboratory, medical libraries, etc.

For example, the regional hospitals have pathologists who accept all tissues removed at operation in affiliated hospitals; these are examined, sectioned, and a report is promptly returned to the referring physician. If the pathologist in the regional hospital desires confirmation of his findings, he can take the slides with him to seminars held bimonthly at the medical center, which the Professor of Pathology of the medical school conducts. At other times he may simply mail questionable specimens to the medical school for diagnosis. At the same time, the regional pathologists visit nearby affiliated hospitals at regular intervals to attend clinical pathological conferences, examine frozen sections, and also participate in death conferences and educational programs, etc.

Radiology is conducted in a similar manner: films from small hospitals are sent centrally for diagnosis at the regional center; regional radiologists likewise attend conferences at the medical school twice monthly, where questionable films are discussed by an outstanding specialist in the field. The patient benefits, since the way is open for his x-ray film to be seen by the most competent expert when that advice is needed. Radiologists benefit from the personal, educational atmosphere which ensues when they bring their own problem cases to the teaching center. And, lastly, the practising physician benefits, since not only does he have a higher authority to look to as a consultant, but that consultant also offers to him refresher courses and seminars in the regional hospital.

Another activity of the Bingham Associates Program is called Clinical Diagnostic Aid. The New England Center Hospital, closely affiliated with Tufts Medical School, serves as the medical base to which may come only those patients whom the family physician refers. Presumably these offer problems beyond the scope of local or regional facilities. Every effort is made to maintain the relationship between the referring physician and his patient. The hospital was developed as an adjunct to the regional program, and has remained almost exclusively an institution devoted to diagnosis. Actual treatment is rarely offered, and then only upon the request of the referring physician. Thus, the base hospital offers the physician in an isolated community skilled, non-competitive assistance; the patient remains under the personal supervision of his physician, and it is the latter, not the base hospital, which institutes the recommended therapeusis and follow-up.

The concept of decentralization is here evident again: regionalization through the Bingham Associates Program in New England has encouraged and stimulated improved facilities in the periphery, but, when more specialized facilities and personnel are required, non-competitive diagnostic assistance is rendered through the metropolitan teaching hospital.

The third facet of the program embraces an interne-residency program. Undergraduate medical teaching is conducted in the base hospital, which is closely integrated with the medical school. Residencies are available, also, in such fields as internal medicine, surgery, psychiatry, neurology, and anesthesia. However, regionalization is the topic of this panel, and I will outline how parts of the interne-resident program have been regionalized in New England. Teaching residents, who are young physicians with three or four years of special training in internal medicine, have been installed in each of the two Maine regional hospitals and in several Massachusetts hospitals. These men have the responsibility of stimulating and developing the educational activities of the house staff. They visit Boston twice monthly to attend all-day teaching programs at the Medical Center. In effect, they might be called the full-time directors of medical education at the regional centers, but they are paid by, and look for guidance to, the base hospital.

Medical residents from the teaching center have recently been spending periods of one month each at small community hospitals which are too small to attract a full-time house staff. These residents introduce to the community hospital some of the newer procedures and ideas; at the same time they see, usually for the first time, both the difficulties and the satisfactions of practising medicine in an area removed from the environs of a teaching center.

A new program makes residents of the New England Medical Center available to distant community hospitals for the presentation of practical information on recent medical advances. The residents review the literature on subjects chosen by the staff members of affiliated hospitals, abstract the essentially valuable material, and prepare 45 minute talks that are given at the regular monthly staff meetings of the affiliated hospitals. They go to these meetings, not as authorities, but as bearers of authoritative information crystallized by close contact with teachers at the Medical Center.

A program has been instituted for men interested in gaining the necessary background for general practice; through this arrangement, internes are appointed for a year's training in an affiliated hospital on a rotating basis; the second year is spent at the Medical Center rotating between medicine, surgery, obstetrics, and pediatrics.

The fourth aspect of the program is that of postgraduate medical education, whereby practising physicians from outlying communities can return to the Medical Center for refresher courses. Courses vary in length from one week to several months, and embrace a large number of fields of special interest. Consultants regularly travel to several of the regional hospitals twice a month to conduct ward rounds, give talks, etc. Here again, the two-way flow of activities is reflected—men travel centrally for refresher courses, specialists travel peripherally to conduct postgraduate activities in distant hospitals.

The final facet of the program is that of medical research, conducted at the Medical Center, and designed to stimulate the highest standards of care. In directly, the benefits that accrue to the Medical Center through its research activities are diffused outward to affiliated hospitals through the above-mentioned regionalization program.

To summarize, the present activities of the Bingham Associates Program in New England include: hospital extension services, clinical diagnostic aid in the New England Medical Center, an interne-resident program, postgraduate medical education, and medical research.

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HOME ACCIDENTS

WE welcome the opportunity of presenting to our readers a condensation of the papers presented last fall at a Panel Discussion on the subject of Home Accident Prevention, organized under the auspices of the Subcommittee on Accident Prevention of the Committee on Administrative Practice.

We must take issue with Dr. Brown on the historical priority he gives to the unfortunate Eutychus who suffered a fatal fall, with slumbering during St. Paul's sermon as a basic contributory cause. The literature of the subject can be traced to a much earlier day. We read in the First Book of Samuel that Eli, the High Priest on receiving news of the loss of the Ark of God, "fell from off the seat backward by the side of the gate, and his neck broke and he died; for he was an old man, and heavy." Here is not only a very early record of a home accident but one in which the relation of such accidents to the later age periods was clearly recognized.

Dr. Dunn reminds us that, at the other end of the life span, the problem is also particularly serious, since accidents other than those involving motor vehicles constitute the leading cause of death among children between the ages of one and fourteen years; and rank second between the ages of fifteen and twenty-four years. Such accident prevention programs as those of the States of Kansas and Minnesota and of Nassau County, N. Y., are deserving of wide emulation.

We greatly need, as Mr. Kent emphasizes, the development of effective home safety codes; and it is hoped that studies now in progress, under the auspices of the Committee on the Hygiene of Housing may make helpful contributions in this field. We need, as Dr. Chesley indicates, to mobilize all the resources of the health department—not only its engineers and health educators but also its specialists in vital statistics, maternal and child health, public health nursing, mental health, and local health services; and to secure effective coöperation with other public agencies concerned with education, housing, fire prevention, industry, and social welfare. The public health nurse, as Miss Phillips reminds us, has a specially important function to perform since "public health nurses enter more homes in any period of time than do any other trained workers in any field." She adds, "to a certain degree, quality of visit will be good only if the nurse incorporates in all of her work with the people the techniques of accident investigation and prevention."

THE NATIONAL SCIENCE FOUNDATION

AN act to establish a National Science Foundation passed the Senate (for the third time) last year without the unfortunate administrative provisions which forced President Truman to veto a previous version. It was reported favorably to the House, but that body has seen fit to add amendments, in the name of that much-abused word "Security," which would make its passage in the proposed form little short of a national disaster. One of these amendments provides that anyone who has "at any time been a member of any organization declared subversive by the Attorney General" shall be found disloyal and therefore ineligible for a science scholarship or for employment by the Science Foundation. Another, even more objectionable, amendment, would require the Federal Bureau of Investigation not merely to investigate and report on the loyalty of individuals but to pass on its own reports and declare the individual approved or disapproved.

That excellent columnist, Marquis Childs, has pointed out that this provision "would give the FBI the same kind of authority that the Gestapo had in Nazi Germany. It would be detective, policeman, judge and jury all rolled into one. These are the powers exercised by Stalin's secret police in Russia."

The Justice Department has protested vigorously against both amendments. As to the first, its official statement points out that "membership in an organization on the Attorney General's list is regarded as merely one piece of evidence pointing to possible disloyalty. The loyalty program enables an employee who is a member of a listed organization to respond to charges against him and to show that his membership is innocent and does not reflect upon his loyalty." As to the second point, Peyton Ford, Assistant to the Attorney-General, states that in the opinion of FBI Director Hoover, "such legislation would constitute a clear departure from accepted fundamental theories of American government and lay a foundation for criticism of the bureau as a state police organization."

The National Academy of Sciences has also protested strongly against these amendments. President Richards says that the provisions in question "would so distort the purpose of the original bill as to work serious damage to the development of science in the United States." He adds that legislation of this type "will defeat the growth of science by inhibiting the free exchange of information so vital to it, by discouraging the bravest and most original of minds, and by the pervasive threat of irreparable injury to individuals inherent in all counter-intelligence measures. If we are concerned with these developments it is not because we ask a special privilege for scientists; it is because they cannot lose their freedom without jeopardizing the freedom of all Americans."

If these hysterical provisions remain in the Bill as passed, we trust that President Truman will have the courage to send in a second veto. Even scientific research does not warrant the sacrifice of those democratic principles for which we fought a Revolution and two World Wars.

By the time this editorial appears, the deplorable House amendments will probably have been eliminated in conference with the Senate. We confidently hope for a free National Science Foundation in the not far distant future.

Scientific research is now conducted, and we certainly hope will continue to be conducted, through the widest diversity of organizations and means which our institutions afford. The larger industries have their research divisions, in which work primarily of interest within the several industries is carried on, but with an increasing awareness of how very broad scientific understanding must be if it is to

provide a sound and rational technology and open up the new developments of progressive industry. Many branches of the federal and local governments conduct research in the interests of health, of agriculture, of mining and metallurgy, of standards of measurement, and of many other special objectives. We have foundations and associations oriented to the study and control of tuberculosis, cancer, heart disease, poliomyelitis, nutrition, mental hygiene. Moreover, it is fortunate that among those who govern the allocation of funds within these special-purpose organizations there is a considerable representation of scientists who see these specific problems as special cases of broader principles which must be understood and applied if the specific problems are to receive more than the most empirical and temporary solutions.

The simple fact remains, however, that the order of nature, toward the understanding of which science constantly strives, is all-inclusive. Infectious disease may be advantageously studied in terms of tuberculosis or poliomyelitis, growth may be investigated in terms of the abnormal phenomena of cancer, or degenerative processes in terms of heart disease. Yet the general problem is in each case far broader than the special instance. Such subjects as the understanding and control of growth, of host-parasite relationships, of senescence, of emotional and social adjustment, represent far more inclusive values than any or all of the special and partial objectives which have been mentioned.

American science greatly needs the longer view, the broader vision; it needs a greater concentration upon the discovery of the universal rather than merely the particular. It is perhaps to this maturing of purpose and direction that the National Science Foundation can contribute uniquely. Not limited by any partial or short-range objective, it should be free to aid fundamental science most broadly conceived. Its spheres of interest should certainly include matter and energy in their physical, chemical, and cosmological relationships; they should include that most intricate and marvelous of systems, the stuff of life itself, protoplasm, and its myriad and protean manifestations; they should include the psyche and its normal and abnormal manifestations in man and in the relationships of mankind in society. The National Science Foundation, it is to be hoped, will have the challenging opportunity to plan far-sightedly for the selection and training of those with tastes and aptitudes for both the natural and social sciences, and to encourage and aid fundamental research on a continuing basis, not subject to the insecurity and limitations of yearly subsidy. A National Science Foundation in brief may introduce much needed vision, foresight, and material aid toward the gaining of insight into the order of nature and its application toward rational and harmonious living.

ADVANCEMENT OF PUBLIC HEALTH IN LATIN AMERICA

THE past quarter-century has shown an astounding development in public health throughout Central and South America. This growth has been so rapid that few North American sanitarians realize either the extent or the intensiveness of this change.

A generation ago there were only a half dozen centers of biological or medical research in all Latin America. Now, every South and Central American republic, almost without a single exception, has a well established nucleus of sound bacteriological, parasitological and clinical research, with a well qualified and diligent staff.

Medical schools have improved their teaching. Full-time pre-clinical departments have been initiated. Graduate schools of public health have been established in Sao Paulo, Brazil; Santiago, Chile; Santa Fe, Argentina; and in Mexico City. The nutrition research laboratories in Guatemala, under the joint auspices of several Central American nations, are unique. Dr. Hurtado's high altitude studies in Peru are of unsurpassed brilliance. The biological institutes in Rio (Oswaldo Cruz), in Sao Paulo, in Montevideo, in Buenos Aires, in Santiago, Chile, in Lima, in Bogota and in Mexico City, all have a fine group of young, intelligent, devoted scientific personnel, studying the special problems of their nations, as well as general basic subjects of world-wide import.

Beautiful, modern, well equipped health centers are encountered in every large Latin American city, and in many of the rural areas, with full-time trained personnel, and functioning satisfactorily. In fact, the health center concept is more widely dispersed and accepted in Latin America than in the United States.

The Medical Center at Sao Paulo, with its group of beautiful hospitals, a fine medical school, a well developed nursing school, a great Bacteriological Institute, and, particularly, its fine Graduate Institute of Public Health, has become one of the centers of medical research and teaching of the world.

A great many of the young medical and public health scientists of Latin America have received their graduate training in the United States. English has become the basic secondary scientific language of all Latin America. The cordial feeling of scientific interrelationship, and the mutual interchange of scientific knowledge between North America and Latin America is one of the most gratifying developments of recent years. North American medical science has much to learn from Latin America.

The coming years should bring increasing exchange of personnel, and of ideas, and a continued growth of cordial international friendship among the scientists of both continents.

NOTHING NEW UNDER THE SUN

THE problem of chronic disease is in 1950 perhaps the most challenging of our "new" public health programs. The Editor was amused therefore, in browsing over back numbers of this *Journal* (a habit which we strongly recommend to our readers) to find that at least one of our imaginative authors saw the point thirty-five years ago.

Dr. Horace Greeley of Brooklyn [1] at that early date contributed an article on "The Public Health as Affected by Chronic Diseases of the Heart, Kidney and Arteries," in which he presents good statistical evidence of the importance of the problem, notes that it is a problem not limited to the later age periods, discusses the role of rheumatic fever and syphilis, of occupational poisons, of overwork and nervous tension and of over-eating, in causing cardiovascular conditions; and closes with a vigorous appeal for a far-flung campaign of public education in regard to chronic disease. It would bear reprinting today, with very few alterations, as a Tract for the Times.

Truly there is nothing new under the sun. When you have a novel idea, look the subject up in the Index to this *Journal* [2] and you may be surprised.

1. *A.J.P.H.* 5, 705; 1915.
2. *A.J.P.H. Index to Volumes 1–35, 1911–1945.* Champaign, Ill.: Garrard Press, 1947.

Clearing House on Public Health Salary Information and Personnel Needs

LOCKING THE BARN DOOR

The Massachusetts State Department of Health in early 1949 had a tragic series of resignations by medical staff members who went on to greener fields in terms of salary. Now has come a recently revised schedule of medical salaries for the department which indicates increases ranging from 4 to 21 per cent in salaries for the various medical positions of the department. Perhaps other state departments can persuade the keepers of the coffers to raise the ante from say a top of $6,900 to hold the man or woman who can go elsewhere at $8,500 before, rather than after, the loss has been suffered.

INCOME OF DENTISTS

An analysis of the income of dentists for the 20 years, 1929–1948, appears in the January *Survey of Current Business*. Its detailed figures are worth studying. But the first table on net income by form of practice immediately provides one clue to the shortage of public health dentists. The income of independent dentists in each category is larger than that of salaried dentists; income of salaried dentists employed by another dentist is higher than of those employed by industry and government.

Survey of Current Business is published monthly by the Office of Economics, U. S. Department of Commerce. It is a tool that should be known to those dealing with salaries, living costs, and allied problems relating to personnel. One of its continuing projects is the series on income of professional groups. The one on dentists' income is the second to be published in the post-war period, the first having been concerned with income of lawyers.

A SECOND CALIFORNIA SALARY STUDY

As of October 1, 1949, the California State Health Department made a study of salaries of full-time professional personnel in the state's local health departments. Reporting in the study were 51 full-time health departments, an increase of two over the first salary study made in January, 1949. Both budgeted and filled positions increased by about 11 per cent and vacancies decreased by about 4 per cent. The report ventures no general statement as to salary trends but suggests a comparison between the two studies. The reason for the studies is expressed in this sentence, "We hope this information will prove of value to local health officers in their efforts to recruit and maintain well qualified workers with pay scales adequate to training, experience, and demonstrated abilities." Ellis D. Sox, M.D., Chief, Division of Local Health Service, 762 Market St., San Francisco.

A NEW NURSE RECRUITMENT LEAFLET

Nursing is perhaps the leader among the several public health professions in the extent to which it has carried out recruitment programs. The newest publication of the Committee on Careers in Nursing is *Nursing: Is It Your Career?* This is an attractive blue and white folder of pictures—12 that show what and where the nurse learns, and 12 as to fields that are open to her, including public health, industrial nursing, visiting nursing, work in nursery schools, army, navy, and Veterans Administration, as

well as the usual private duty, obstetrical, and surgical nursing.

This is one of the materials available for the 1950 recruitment program of the committee. It is expected that the number of 1950 admissions of new stundents into schools of nursing will exceed the 1949 record of nearly 44,000.

The pamphlet is available from the Committee on Careers in Nursing, 1790 Broadway, New York 19. Single copies free, additional copies up to 100, 5 cents; 100 or more copies, $4.00 per 100.

EXPLORING THE TWO WAY STREET BETWEEN MEDICINE AND THE SOCIAL SCIENCES

When the social sciences will have had their full impact upon medical education, preventive medicine and public health will take their rightful place in the education of the doctor and nurse. A program for hastening such an impact is now in progress at the Cornell University Medical College and the Cornell University-New York Hospital School of Nursing. Supported by the Russell Sage Foundation, this two year program of studies is designed to find what the social sciences can contribute to broadening medical and nursing education and what in return the social sciences will receive.

The program is under the direction of Leo W. Simmons who is on leave from his work as associate professor of sociology in Yale University. He is visiting professor of anthropology in medicine at the Cornell Medical College, and in nursing at the Cornell University-New York Hospital School of Nursing for the period of the experimental studies.

Professor Simmons is working with the Department of Medicine and concentrating on the Psychosomatic Clinic of New York Hospital where young physicians who have completed residences in medicine have an opportunity to gain further insight into the emotional components of disease. In the nursing school he is exploring teaching areas for the preparation of the nurse in planning community health programs as well as the physical, social, and emotional needs of her individual patients. In both schools he is working toward a broader concept of the play of sociological and psychological factors upon sickness and health.

In announcing the program, Stanhope Bayne-Jones, M.D., president of the Joint Administrative Board of the Medical Center, said, "The modern trend in all medical science is the recognition of the need for individualizing patient care through the understanding of physical, mental, and social factors affecting each patient."

PERSONNEL POLICIES ON RECORD

The personnel officer of the Georgia Department of Health, Harry Chester, has initiated "Personnel Pointers." This is a series of short bulletins about principles and procedures of personnel administration in the department, including both merit system and departmental policies. They are intended primarily to get personnel information to the executives, including district directors, in the State Health Department, but frequent reference to County Health Commissioners indicates that they are also circulated to county health departments for suggestions as to personnel methods.

The series, numbering 15, describes, for example, basic principles, job description, classification plan, examinations, permanent status, separations, etc. Georgia is said to be the only state that is using this method to acquaint its executives with the operating details of the merit system and personnel office. It might well be copied elsewhere.

THIS SPACE NEEDS A LIGHT NOTE

A request for information recently referred to the "Cleaning House in Public Health Salary Information." Unconscious praise or criticism?

Credit Lines

ALL THAT NEEDS TO BE SAID

"It is not good to be a scientist unless you think it is of the highest value to share your knowledge with anyone who is interested.—J. Robert Oppenheimer." These words are on the cover page of *Ohio's Health* for January, 1950. Congratulations to its editors for featuring these sane words in a world reeling with the secrets of A-bombs, H-bombs—that are no secrets.

But this also has something to say directly to public health workers. It might be the introduction to the letters annually written by A.P.H.A. Section secretaries to annual meeting speakers in which they are asked—nay implored—to furnish copies of their papers and meaningful abstracts so that what they know may be "shared with any one who is interested."

A NEW HEART PUBLICATION

The rapidly expanding program of the American Heart Association in the past several months is signalized also in a new quarterly publication, *The American Heart*. The September, 1949, issue was Vol. 1, No. 1. Of its purpose the masthead says, "Published in the interest of broader public understanding and support of the Association's program in the field of cardiovascular disease."

One can see the present "grass roots" pattern of the Association's current growth both in the large proportion of space devoted to news—and interesting too—of the various state affiliates and in the fact that publication is by the American Heart Association and its affiliates. Neither of the first two issues says so, but the usual "reliable sources" are authority for the information that this new publication is prepared in the Public Health Division whose chief is John W. Ferree, M.D. The publication office is 1775 Broadway, New York 19.

WEST VIRGINIA'S NEW HEALTH VIEWS

January, 1950, saw Vol. I, No. I, of *Health Views*, a quarterly of the West Virginia State Health Department. That it will be sent to any resident of the state upon request is the indication of its purpose. How it came about is mentioned editorially, "For some time, folks throughout the state have been asking why there wasn't some way of knowing what others are doing and thinking about health protection. We too felt the need for some continuing channel of communication. So here it is." This first issue has a good deal of background on what public health is, discusses the national picture with particular reference to the federal local health units bill and analyzes West Virginia's recent legislation reorganizing the state health department. The state director of health, N. H. Dyer, M.D. and the editor, W. H. Rost, are to be congratulated on *Health Views*.

MASSACHUSETTS CHILD HEALTH STUDY

As the various state reports on the American Academy of Pediatrics' study of child health services appear, they illustrate graphically the advantages of the diversified approach. Instead of being a stereotyped series that would be deadly dull by the time the 48th appeared, they have many approaches to what is basically the same type of information. The Massachusetts report is summarized in the January *News Letter* of the Department of Public Health. It includes short summaries of the chief findings, line drawings of children in various poses, and simple graphs. "The 12th wealthiest state in the Union should

not stand in 20th place in infant mortality or 22nd in maternal death rate," it says by way of heading off complacency about the many areas of child health care in which Massachusetts is ahead of the procession.

SCHOOL HEALTH INSTRUCTION GUIDE

The editor of the *Annual Health Instruction Year Book,* Oliver E. Byrd, who is also health education consultant of Stanford University, has for the past two years been coediting a health instruction guide for the Tulare County (Calif.) schools. A coöperative project of some 25 state and local voluntary and official agencies, the result is a handsome, well bound product. The chief content of the volume is made up of the objectives, pupil experiences, integration methods, evaluation techniques, instructional materials, and references for 16 different subjects for the various school grades. The volume carries no information as to its availability outside of Tulare County or of California.

ANYWAY IT'S UNIQUE

The Walton County (Ga.) Health Department serves a population of about 20,000. Its Health Officer is Ernest Thompson, M.D. Its latest attention getter is a sponsored loose leaf engagement calendar whose alternate pages are photographs of health department activities. In the captions are included 1949 annual statistical data such as "3,974 typhoid vaccinations were given in the County," "80 per cent of Walton's babies are born in the hospital," etc. The outside covers are handsome pictures of the county and health department buildings respectively.

COÖPERATION EVOLVES INTO UNION

Tacoma and Pierce County, Washington, with a total population of over 200,000, in 1949 consolidated their health departments in accordance with enabling legislation passed by the 1949 Washington legislature. As in the case of the recent Wichita-Sedgwick consolidation in Kansas, the formal union followed a period of informal coöperative working relationships which grew out of the fact that the position of Pierce County Health Officer was unfilled. During this period the Tacoma City Health Officer served as consultant to the County Department with which many services had been jointly carried on for a number of years.

As a part of the formal merger the consolidated health department moved into a new modern health center building. C. R. Fargher, M.D., who has been Tacoma City Health Officer since 1943, continues as health officer of the consolidated city-county department.

This leaves but two major cities in Washington whose health services are not consolidated with their respective county health departments: Spokane in which both a city and county full-time health department are located; and Everett which has a part-time health officer, while Snohomish County has a full-time department.

BI-COUNTY TUBERCULOSIS SOCIETY

News has been received of the incorporation of the Bradford-Sullivan County Tuberculosis and Health Association in Pennsylvania. This is the result of a merger of the separate tuberculosis societies in the two counties. There is now a single board of directors, and the former Bradford County executive, Francis Donahue, continues as the executive secretary of the larger organization.

This merger would appear to be in line with National Tuberculosis Association policy which recommends mergers when they can strengthen local associations. One of the reasons for the merger is evident: Sullivan County has a population of less than 10,000. By joining forces with its neighbor of 50,000, it can carry out a well rounded community

tuberculosis control program such as it could not by itself. Is this merger a suggestion for a similar merger of official health departments, assuming only that the necessary changes in the state's public health law will some day be forthcoming?

SYPHILIS PROGRAM GETS RESULTS

One of the most striking achievements to come across this desk in recent months is the report *Evaluation of the Syphilis Control Program Biloxi Area—Harrison County, Mississippi, 1942–1948*. The results of this careful survey show a drop from an infection rate of approximately 30 per cent among Negroes of the Biloxi area to a prevalence of only 2.83 per cent of new cases since the inauguration of the control program. Such a reduction in the syphilis rate is reported by the authors to be the greatest they have seen published. The full report which was written by Andrew Hedmeg, M.D., and W. E. Frost, director and venereal disease investigator respectively of the Harrison County Health Department, appeared in *The Mississippi Doctor* for October, 1949. Reprints are available, presumably from the Harrison County Health Department, Gulfport.

A DENTAL HEALTH PROGRAM

The American Dental Association has spelled out the broad principles for improving the dental health of citizens. It is distributing widely, in a bright blue leaflet, *A Dental Health Program for the Community, State and Nation,* as unanimously adopted by the House of Delegates at the 90th annual meeting in October, 1949. Here are outlined what activities should be carried by official health agencies in the three levels of government.

The Association has also published a bibliography of dental health education material for laymen, school teachers, and the health professions. The Association distributes these materials which have been produced by many different agencies.

The Council on Dental Health of the Association has four new dental health pictures in its motion picture library. All 16 mm., sound, they are: It's Your Health; Your Child's First Visit to the Dentist; Save Those Teeth, and Dental Health: How and Why. Each can be rented from the American Dental Association (222 E. Superior St., Chicago 11) at $2.50 per day or $4.50 per week.

CITIZEN INVOLVEMENT IS THE KEY

In "A Tale of Two Surveys," in the winter issue of PCA's *Currents,* Ann O'T. Broughton contrasts what happened to two surveys in Pennsylvania, the Pittsburgh Survey and the state health survey. Her topic sentence and text is "It makes a whale of a difference *how* things are done."

Thus the Pittsburgh Public Health Survey was made by the U. S. Public Health Service only after a citizens' committee had been set up, with numerous specialized subcommittees. One of these served as the governing body of the survey. Because the survey, when completed, had the understanding and support of citizens, its recommendations could be carried out—in fact, the city fathers jolly well heard about it when a "political appointment" of a health department staff member was suggested. Because the citizens' committee representing all shades of opinion has made public health a citizens' program and because the press was kept fully informed, the Pittsburgh Health Department was revitalized in less than two years.

And what of the orphan, the Pennsylvania State Study? No citizens' committee was appointed, the report was not made available to the press until just before the Legislature was adjourned and thus got short shrift from the press. Now it is necessary to build

up that citizen support, which is being done by PCA and a number of other agencies. But at best they are foster parents not in on the birth. Says Mrs. Broughton "We must learn to be responsible and good foster parents so that our bouncing baby can, despite a tough delivery, lead a productive life."

REAL OSCAR FOR HEALTH DOCUMENTARY

It's all very well for Olivia De Haviland to get an Oscar. But what is exciting the public health world is the Oscar for "So Much for So Little." Produced by Warners for the U. S. Public Health Service, it tied with "A Chance To Live" in winning the award for documentary short subject in the annual Hollywood "Oscar Derby."

"So Much for So Little," an animated technicolor short, portrays in 10 minutes some of the highlights of what a health department does for a community and its citizens. It was released in the Warner Brothers and Fox chains of theaters early in 1950. As soon as the showing in commercial theaters has been completed, copies will be made available to each state health department for widespread showing. The Public Health Service and your state health officer can tell you when, where, and how you can see it in your town.

"A Chance To Live," the documentary short with which "So Much for So Little" received a joint "Oscar" is not without interest to public health workers. It is the March of Time story of the Boy's Town near Rome where bombed-out, homeless, friendless Italian boys are given a new chance at a "sound mind in a sound body."

CONSOLIDATION IS FASHIONABLE

Consolidation of school districts has a longer history and a faster pace than consolidation of health services. Even the former has been accelerated in the recent years of critical teacher shortages. *Public Management* of February, 1950, reviews the present status of school consolidation. In Arkansas, school districts have been reduced from 1,500 to 428 since November, 1948, with all school districts of fewer than 350 pupils abolished. Idaho has cut districts in half by requiring a minimum of 150 pupils and 7 teachers in a high school and a teacher per grade in elementary schools. Illinois, Kansas, Missouri, North Dakota, Pennsylvania, and Washington are among other states that have reduced the number of school districts.

The story further reports that school officials generally agree that legal incentives for consolidated school districts should include, among them, increased state aid for transportation and proportionately more state aid for consolidated districts than for others. This latter is a leaf out of the same book that the New York legislators used in providing more state aid for county-wide than for municipal health departments in that state's most recent health unit legislation.

ANNUAL REPORTS

Strategy of the American Social Hygiene Association, as illustrated by activities in 1949, is this agency's annual report. A.S.H.A. is now 37 years old and in good fighting trim. It reports that it has a simple strategy of serving the nation as a whole, reaching the millions as well as individuals, demonstrating new methods and materials, stimulating research, training leaders for social hygiene goals, and representing the social hygiene philosophy in the national and international scene. A full page map stars its activities round the globe from Fairbanks to Rome. This is a short attractive and meaty story of how A.S.H.A. "generates power in the social hygiene movement." 1790 Broadway, New York 19.

American Heart Association, annual report, 1949 is the first year's report following the reorganization of the Associa-

tion as a national voluntary health agency. It can report that in this year it has "grown almost unbelievably in size, influence, and activities," because "the Association now belongs to the public." The report is short but tells what each division is doing, illustrated with an organization chart. The three purposes of research, community service, and education are briefly described. It's a handsome production as well. 1775 Broadway, New York 19.

Your Health Department Reports on Its Many and Varied Activities is the 1948 annual report of the Hawaii Territorial Health Department. If a public health department and its adequate reporting to citizens were a criterion, there would be little doubt that Hawaii would achieve statehood forthwith. The report is factual, extensively illustrated with both photographs and charts, and attractively produced. It reports on the health department's chief responsibilities, its many programs, unfinished business, and needs. Charles L. Wilbar, Jr., M.D., is president and executive of the Territorial Board of Health.

Annual Report of the Federal Security Agency, 1949: Public Health Service is one of 8 separate reports that make up the entire FSA annual report. It has considerably less statistical material than in the previous year and is in fact a somewhat slimmer volume. Using the mid century as a springboard, it takes both a backward and a forward look and emphasizes particularly public health's responsibility for a concern with chronic disease, a responsibility that flows directly out of the success of 50 years of controlling tuberculosis, the communicable diseases of childhood, and the hazards of early infancy. Gov. Ptg. Office, Washington 25, D. C., 40 cents. The report of the Office of Vocational Rehabilitation is accompanied by a 5 year summary in the modern method. It is entitled "Brass Tacks" and gets its message across chiefly through color, form, and illustration. The annual report is 15 cents from the Gov. Ptg. Office, "Brass Tacks" appears to be free from the Office of Vocational Rehabilitation.

Social Science Research Council, Annual Report 1948–1949 is the story of a half million dollar operation. Through some 32 separate research committees and some 80 research fellowships the Council attempts "to increase the store of knowledge available for dealing with human problems." Social Science Research Council, 230 Park Ave., New York 17.

Annual Report for the Year Ending June 30, 1949, The American National Red Cross uses Albert Schweizer's faith, "reverence for life," as the touchstone of its service. In word and picture the many sided story of Red Cross Services is told. A 50 page appendix gives all the data even the most statistical minded could wish for. Washington, D. C.

WORTH ACQUIRING

What We're Doing for Our Children, Study of Child Health Services in Louisiana is the summary of the Louisiana study of child health services conducted as a part of the nation-wide study by the American Academy of Pediatrics. It is particularly valuable as an illustration of how to get facts across interestingly—and even gaily. The puckish little children on nearly every page will carry the reader through each of its attractive white, green, and black pages. Louisiana Study of Child Health Services, 1560 Line Avenue, Shreveport 39.

Enjoying Leisure Time, by William C. Menninger, M.D., complete with an instructor's guide and a full size colorful poster is the newest of 21 titles in the Life Adjustment Series. These are written for young people in language attractive to them. The famous psychiatrist author announces as his purpose "to help *you* find more fun in living—now and later," by getting the most in emo-

tional security through recreation. Science Research Associates, 228 S. Wabash Ave., Chicago 4, 60 cents — less for quantity orders, $8.40 for a sample kit of the 21 titles.

It's Smart to Eat Breakfast, directed especially toward the teen-ager is a magazine size booklet published by the American Education Press. It is in story form with lots of pictures and a good deal of emphasis on athletic recreation — swimming, sailing, cycling, etc. There's also a good deal about soil in relation to nutrition and the history of nutrition. Is being made available by the Cereal Institute, 135 So. LaSalle St., Chicago 3.

WHO: What It Is. What It Does. How It Works is a very attractive leaflet in red, black, and white that tells in simple terms the basic facts about the World Health Organization. It takes a few such tongue twisting phrases as "biological standardization" and explains them in terms of the individual who is given a dose of penicillin, for example. This is a very good medium for broadening the interest of the public health worker — and others as well — in the world beyond his own backyard. And it is also good for reënforcing the idea that health activities cannot be carried on in a vacuum but are related to the agriculture, industry, education, and many other socio-economic factors of a country. Free from World Health Organization, United Nations, Lake Success, N. Y.

For learning more about United Nations generally, there is the Mount Holyoke Institute on the United Nations, June 25–July 22, which can be had for the whole period or in periods of one week or more. During the first week, UN's specialized agencies including WHO will be under discussion. Registration and other information from Executive Secretary, Mount Holyoke Institute on the United Nations, South Hadley, Mass.

ON PICKING UP THE 1950 EDITION OF
THE CONTROL OF COMMUNICABLE DISEASES IN MAN

There once was a simple — a friendly little book
Which gave me all the data on C-D-at a look,
I picked out a title, I tracked down the germ,
'Twas easy to distinguish a virus from a worm.
—But oh — this *new* edition — this 'cyclopedic tome,
I'm lost among Bacilli — I'm very far from home!
Where would I see Oroya, Mud Fever or the Yaws,
And where these other terrors that nearly break my jaws?
Give me a simple Measles, some Favus or the Itch
I'd even welcome Rabies — I'd know which dog to hitch!
But stop! These are the whinings of a dull and narrow mind
We serve the WORLD by printing a booklet of this kind.
So welcome ticks from Java or snails diseased and pink;
I'll swat new flies and trap strange rats and disinfect my sink.
I'll be a fan of WHO's-this, no matter what the price—
Just let me call a spade a spade
And *Lousiness* — just *Lice!*

D. D.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

A Pattern for Hospital Care—*By Eli Ginzberg. New York: Columbia University Press,* 1949. 268 pp. Price, $4.50.

A rather remarkable book, for several reasons, is this objective, administrative, social and economic report to Governor Dewey of what the preface declares to be "a comprehensive study of hospital care in New York State." One remarks the characteristics of a one man book, which the author, a novice in the field, clearly claims to be the case. Pressure for completion promptly, and difficulty of choice of opinions among the 18 staff members and the 250 persons, acknowledgement of whose assistance is listed, perhaps made this necessary.

A fourteen months job of such scope demanded concentration and decisive opinions, usable by the state government and to a degree compelling upon the Legislature. Evolutionary adjustment is the slogan and assumes concerted and early action. One remarks the entire absence of quotable references for any aspect of the wide range of material, offered to the reader in general as original, novel, and convincing. One finds little evidence of compromise or alternatives and a tendency to the either or, and all or nothing philosophy in arriving at recommendations.

One remarks also the absence of any reference to other hospital service studies or to the experience of other states or cities. Some may think this marks a kind of provincial or parochial smugness, and yet the pattern offered and well supported in design and objective is well founded and could be wisely accepted in many another of our great states and widely applicable. Like the recent Health Survey of Chicago this volume is so directed to the New York City and State audiences as to have little appeal to the administrator of hospital plans in California, Michigan, Massachusetts, or Illinois.

History is not the strong feature of the report which smacks of mechanized academic production, almost inhuman in its apparent indifference to the personal factors of hospital traffic, to the quality of medical care, by reason chiefly of emphasis upon economics.

One remarks the lack of reference to prevention of disease as a major resource for reducing demand upon hospital beds. A permanent state control board for hospital and other institutional and agency care of the sick may serve New York well as it has other states.

The 268 pages are packed with challenging facts and opinions presented clearly. The five parts and their 22 chapters with a good summary of recommendations at the start and a skimpy 2 pages of index at the end, are admirably organized and well edited.

As a physician the reviewer hesitates to complain of non-medical analysis of the doctor's most important instrument of organized social usefulness, but he may be pardoned a certain disappointment in the product.

HAVEN EMERSON

Ecology of Health: The New York Academy of Medicine Institute on Public Health, 1947—*Edited by E. H. L. Corwin, Ph.D., New York: The Commonwealth Fund,* 1949. 193 pp. Price, $2.50.

This is a stimulating, useful, small book. The volume "is based upon

papers presented by well known leaders in the fields of social biology, public health, and clinical medicine at the Institute on Public Health of the New York Academy of Medicine." It will be an exceptional reader who has broad knowledge in all the subjects and who will not learn from several chapters. Many readers may be surprised to find "mutational prophylaxis" convincingly presented as a must in medical education. This section on "Genetics and Public Health" considers both fundamentals and pertinent aspects of radiation. The bill-of-fare also includes nutrition and maternal health, animal and insect reservoirs of disease, climate, geography and disease, realities in preventive psychiatry, trends in state and local health services, the Hospital Construction Act, and education of the layman. The last subject is presented through a provocative essay which is challenging to physicians and other educators, although it is somewhat weakened by free use of the absolutes "all" and "none." The volume will be useful in extending the reader's education and providing opportunity for experiencing considerable activity of his imagination and projection of thinking.

The reviewer feels dissatisfied regarding the term "ecology of health." Human ecology, on the other hand, seems to offer great unexplored opportunities as a point of focus for many disciplines.

ROSCOE P. KANDLE

Safe and Healthy Living—*By J. M. Andress, I. H. Goldberger, Marguarite P. Dolch, and Grace T. Hallock (rev. ed.) Boston: Ginn & Co.*, 1949. 8 Volumes. Prices, Grade I, $1.16; II, $1.24; III, $1.28; IV, $1.32; V, $1.40; VI, $1.44; VII, $1.52; VIII, $1.56. Teachers Guide I, $1.68.

The revised edition of this very popular elementary school health education series will continue to meet favor with those who have been using it. These authors have composed one of the more desirable series in the elementary field, with one volume planned for each grade and covering an extraordinarily wide range of knowledge and practice, which can be recommended for elementary children. The books are planned to extend through the eighth grade and may be used not only as typical elementary school readers but also as guides for laboratory practice and actual experiences in healthful living.

Space does not permit the outlining of each book, but it must be noted that the series, taken as a whole, is practically encyclopedic. The authors have included such interesting features, in addition to the prose text, as lists of questions to discuss, interesting things to do together, and vocabulary tests.

The series is beautifully illustrated, not only with colored drawings, but with excellent photographs, and accompanying each series is a teacher's guide which has many helpful suggestions.

DELBERT OBERTEUFFER

Outlines of Food Technology—*By Harry W. von Loesecke. (2nd ed.) New York: Reinhold Publishing Corp.*, 1949. 585 pp. Price, $7.50.

The applied science of food technology has made giant strides in the past decade. Thus, older books in this field soon lose their accuracy and usefulness. The author has brought together in fifteen long but fact-packed chapters, the up-to-date facts of food science and technology. Serious omissions and errors of the first edition (1942) have been corrected. For the chemist and dietician useful chemical analyses of most foods are given. Essentially elementary and descriptive in his treatment of subject matter, the author binds together relevant material from scattered sources into a logical and very useful volume. A very good book for the shelf of the health officer, laboratorian, dietician, and sanitarian. Incidentally the book also serves

well as an elementary text in the teaching of food technology.

CARL R. FELLERS

Meat and Meat Foods. Processing and Preservation from Meat Plant to Consumer—*By Lloyd B. Jensen. New York: Ronald Press,* 1949. 218 pp. Price, $3.75.

This is another volume in The Humanizing Science Series, in which Jensen explains in nontechnical language the processes which make meat and meat products safe and nutritious foods. Coming as it does from one of the most active laboratories and research centers in the meat industry, and written by a man who has worked for years in it, *Meat and Meat Foods* is a good book. It should be read by all who are concerned in any way in the meat industry: operating men, inspectors, refrigerator engineers, deep-freeze operators, meat cutters, and especially by dieticians, teachers of home economics, public health officers, and food technologists.

Each of the fourteen chapters contains much information of great value to anyone who professes to have knowledge about meats. Only those who have some competence know how much such knowledge is needed in many quarters and even by those who profess to know. Jensen has prepared an interesting volume which should be in the library of every individual who works in any way with foods and who desires to be informed. The fact that non-technical language has been used in no way detracts from the value of the book for technically minded and trained workers.

FRED W. TANNER

Streptomycin and Dihydrostreptomycin in Tuberculosis—*By H. McLeod Riggins and H. Corwin Hinshaw. New York: National Tuberculosis Association,* 1949. 545 pp. Price, $7.50.

In this volume we have a storehouse of information regarding the value and limitations of the recently discovered tuberculosis antibiotics, providing laboratory and clinical data, with results tabulated in some instances as late as April, 1949. Original papers of experimental and clinical studies are reprinted. Reports from the American Trudeau Society investigators and from the Streptomycin Committee of the Veterans Administration combine to afford a beautiful example of coöperative team work which has had the effect of securing quickly a maximum of accurate data in regard to the indications for chemotherapy, dosage, duration of treatment, toxicity, and drug resistance. Additional papers are presented by specialists on various phases of the problem, such as bacteriology and pathology in relation to chemotherapy of tuberculosis, integration of chemotherapy with other procedures, especially collapse therapy and lung resection, combined therapy using various combinations of streptomycin, dihydrostreptomycin, para-aminosalicylic acid, and promizole.

Six manufacturing pharmaceutical firms donated $1,000,000 worth of streptomycin for the above studies. In all, 58 specialists contribute to this volume, making it historically valuable and statistically dependable.

Further experience will alter techniques, and it is to be hoped that a more ideal drug than streptomycin will be forthcoming. Up to the time of going to press the views held include the following:

Streptomycin is useful in certain forms of tuberculosis, details of which must be culled from the text; the dose of streptomycin ordinarily need not exceed 20 mg. per kilo of body weight; intramuscular injections twice daily are as effective as more frequent injections; drug resistance is postponed by the use of low dosage and, apparently, also by the concurrent use of para-aminosalicylic acid; toxic manifestations are unusual if the above dosage is adhered to. Dihydrostreptomycin is less toxic than streptomycin in identical dosage; the duration of treatment needs to be varied with the problem presented, but

usually 60 days of treatment are as effective as 120; streptomycin is a valuable adjunct to chest surgery if properly timed; relapses occur during and after treatment with streptomycin, though not often enough to destroy its overall usefulness; streptomycin cannot be recommended for minimal pulmonary tuberculosis until some means of avoiding drug resistance is found.

JOHN H. KORNS

Dental Caries—Clinical and Experimental Investigations — *By T. Ockerse. Pretoria, South Africa: Department of Health.* 80 pp.

This book presents a very interesting report of experimental techniques and findings in the field of dental caries. Although brief, it is complete, and the method of presentation of the material is orderly and in excellent continuity.

There are four distinct parts to the book. The first deals with a review of the literature in the field of dental caries. Combined with this review is a good topographical description of the provinces of South Africa. Such pertinent facts as vegetation, climate, mineral deposits, and other environmental factors which have a bearing on the incidence and prevention of dental caries are discussed.

The second deals with the actual procedures employed in carrying out the experimental and clinical studies relating to dental caries. The experimental techniques and clinical studies are comprehensive enough to merit study.

The third part is a discussion and summary of the preceding parts. Correlation between the literature review, the environmental factors in the Union of South Africa and the experimental and clinical studies are discussed and clarified in a well ordered manner. The fact that all of the findings were made on the white people and not on the natives makes the comparison with other research and clinical work in other parts of the world somewhat easier and more authentic. Included with the discussion are some recommendations which are quite complete and interesting and verify many earlier findings in the field of dental caries research. The tables, charts, photographs, and maps are interesting and well constructed.

Included is a very good bibliography which tends to add much value for student use. This book would be an asset to any person or group of persons contemplating research work in the field of dental caries. It would also be well placed in a dental school library for use by undergraduate students for classroom reference work, and for postgraduates and practising dentists as an excellent opportunity to help review the field of dental caries research.

L. A. GERLACH

An Epitome of the Laboratory Diagnosis and Treatment of Tropical Diseases — *By Horace M. Shelley (2nd ed.), London: Staples Press,* 1949. 147 pp. Price, $2.25.

This book by the Director of Medical and Health Services of Cyprus, is intended "to supply the busy practitioner of medicine in the tropics with simple details concerning the essentials of laboratory diagnosis and the treatment of diseases common to those climes." Unfortunately, in the reviewer's opinion, it does not accomplish this purpose from a modern point of view. Although many simple diagnostic tests are described, others are mentioned without sufficient description, and many tests are mentioned which would not be available to busy practitioners. In connection with treatment, although many of the well established modern therapeutic agents are included, others which are outmoded or ineffective are also often included without comparison of their relative value, and some of the newer antibiotics are either omitted or added in such a way as to be of little use to the practitioner.

Unfortunately, this edition of the book seems to have been prepared hur-

riedly and carelessly. There are numerous errors due to insufficient checking of the manuscript and proof. Even some of the pages have incorrect headings. The author has also made inexcusable errors in grouping the spirochetal diseases under protozoa, and two protozoan infections under helminths. The compendium of drugs at the end of the book also omits some valuable agents, and includes some which are not mentioned in the text. It is unfortunate that the scientific advances in tropical medicine in World War II have not been more completely utilized in the revision of this book. HENRY E. MELENEY

Hygiene and Public Health—*By Earl B. Erskine. New York: Prentice-Hall,* 1949. 327 pp. Price, $3.75.

This book is intended for college students whose particular interests are in the areas of liberal arts, engineering, architecture, and commerce. Its purpose is to emphasize personal hygiene, the principles of sanitation, and the responsibility of the citizen for community health. The contents are divided into two parts, the first dealing with personal hygiene, the second with community hygiene. Among the topics considered under personal hygiene are digestion, nutrition, teeth, the skin, foot hygiene, heredity, parenthood, and mental health. The section on community hygiene considers health agencies, food control, water supply, sewage disposal, ventilation, heating and lighting, school hygiene, industrial hygiene, and communicable disease problems. There are two appendices containing balanced diet lists, vitamin tables, information concerning sources of vitamins and minerals, and a list of occupational hazards. Finally, there are a glossary of technical terms, a very brief bibliography, and an index.

This book is a curious mixture of technical information on a relatively complex level, combined with an abecedarian consideration of certain problems, especially those concerned with personal hygiene. An example of this may be found in the chapter on health and human relations, where sex hygiene, marriage, and pregnancy are considered. Most of this reads as if taken from a tract written before the advent of Freud, Havelock Ellis, or Kinsey. The section on communicable diseases is based on the booklet *Control of Communicable Diseases* published by the American Public Health Association. On the whole, any teacher who uses this volume will have to supplement it with a good deal of additional material.

GEORGE ROSEN

Human Growth—*By Lester F. Beck. New York: Harcourt, Brace,* 1949. 124 pp. Price, $2.00.

Dr. Lester F. Beck, Associate Professor of Psychology, University of Oregon, who was responsible for the research and planning that resulted in production of the widely accepted E. C. Brown Trust film, *Human Growth,* is the author of this book of the same name. It deals with that portion of "sex education" related to structure and function of the human reproductive system. The data are presented in a context of information on emotional and physical growth. Each of the four chapters includes a set of answers to specific questions that children most frequently ask. Illustrations are numerous and diagrammatic in character. They are, however, psychologically designed to avoid the emotional reactions that might come from stark realism. Designed primarily for the early teen age group, it should also be of real assistance to parents, teachers, and the clergy. From the standpoint of this reviewer, the book is to be highly recommended because the data are presented simply, honestly, and with manifest sympathy, but without confusing emotional overtones.

ADOLPH WEINZIRL

Guide to Diagnosis of Occupational Diseases—*The Industrial Health Division Department of National Health and Welfare and the Division of Industrial Hygiene Department of Health for Ontario. Ottawa: King's Printer,* 1949. 317 pp. Price, $1.00.

This is an excellent reference book to put into the hands of the practising physician. It is concise, readable, and well organized; and combines a number of special features which give it an advantage, for the physician, over more conventional reference books on industrial toxicology.

The discussion of the industrial environment in the introduction is of great value. The lists of exposures, by occupation, provide the physician with a springboard from which to evaluate the possible role of occupation in a particular patient's case, and give him valuable leads as to what further information he is to look for in the body of the book. Some basic definitions are given, including Maximum Allowable Concentrations, flash points, and explosive limits. The definitions of minimum and maximum explosive limits, however, appear to be misleading, in that they do not differentiate adequately between a substance which may burn in the immediate area of an ignition source, and the propagation of a flame away from such source with possible explosive effect.

The alphabetical listing of chemical substances and the treatment of each under uniform headings contributes greatly to the usefulness of the volume for ready reference. In the space allotted, this material has necessarily been greatly condensed. But the subject matter has been wisely selected and a good perspective maintained. One omission of some importance is failure to call attention to the possibility of delayed benzol poisoning, developing only after exposure has ceased.

The Department of National Health and Welfare of Ottawa and the Division of Industrial Hygiene of the Health Department of Ontario are to be congratulated not only on the good judgment used in the selection of material for this compilation, but for pioneering in offering to distribute copies without charge to the medical profession in Canada.

Every practising physician would do well to procure a copy of this book at an early date. MAY R. MAYERS

Health in the Schools. A Manual of the School Health Program. *Boston, Mass.: Massachusetts Department of Education and Massachusetts Department of Public Health.* 90 pp.

Produced under the joint sponsorship of the Massachusetts Departments of Health and Education, *Health in the Schools* is a compilation of suggestions and reference materials for school administrators, health officers, and others who have responsibilities for various aspects of the school health program, particularly the health service program.

Recommended qualifications for personnel engaged in school health programs are presented, including the health coördinator, school physician, nurse, dentist, lunchroom manager, and custodian. The duties of each of these persons, and of the superintendent and principal, are described.

Included in the report are brief statements relating to first aid, communicable disease control, medical examinations, dental health, mental health, and vision and hearing testing.

Although schools make unique contributions to community health through programs of health education, only 2 pages of the 90 page report are devoted to this topic. Probably this is because other bulletins on this subject are available, but no mention is made of this.

Significant recommendations relating to coördination and leadership are expressed in the following words, "Each school system and any large school

within that system should establish an advisory health council of its own to provide leadership and direction for its health service and health education program, and to coöperate with the community health council through duly appointed representatives" . . . "For each such council there must be administrative leadership. There must be one person who has definite responsibility for the total school health program, for coöperation with the medical and dental professions and with community health agencies, public and private."

School health personnel in Massachusetts will be aided by a compilation of state laws relating to "school hygiene."

CHARLES C. WILSON

Hearing Tests and Hearing Instruments—*By Leland A. Watson and Thomas Tolan. Baltimore, Md.: Williams & Wilkins,* 1949. 597 pp. Cloth cover. Price, $7.00.

This book is a collection of facts in the field of acoustics, hearing, design, and manufacture of audiometers and hearing aids. It deals with the physics of acoustics as well as the medical aspects of hearing. There are a large number of illustrations and pictures that contribute to clarifying the subject matter. There is an extensive bibliography which refers to many important papers on the subject.

A glance through this volume finds considerable reference to Maico products, but this is understandable when one notes that Leland A. Watson is President of the Maico Corporation, manufacturers of audiometers and hearing aids. Thomas Tolan, M.D., is the Director of the Department of Otology of the Medical School of the University of Minnesota. There are pages in the book with which some otologists might not agree; as for example, opinions on selective fitting of hearing aids and on the number of hard of hearing persons that should or will wear hearing aids. The book is well fitted for use by those persons who are selling Maico hearing aids and should be of considerable value to salesmen of hearing aids of other firms. Physicians interested in the field of hearing will learn about the problems in this field from the standpoint of the manufacturer. The public health worker will find this book written in a language that is not technical from the standpoint of physics and medicine.

HOWARD A. CARTER

Studies in Population—*Edited by George F. Mair. 1949 Proceedings of the Annual Meeting of the Population Association of America. Princeton, N. J.: Princeton University Press,* 1949. 169 pp. Price, $2.50.

This volume is an experiment to reproduce proceedings of the Annual Meeting of the Population Association of America which previously has had no regular outlet for its papers. Twenty-four papers are presented under five sections, namely, application of demographic data to current problems; tools for demographic research; resources for the world's people; value systems and human fertility and future course of research in fertility.

The public health worker who reads this volume will have his horizons widened in areas that underlie everything he does.

REGINALD M. ATWATER

Industrial Hygiene and Toxicology—*Frank A. Patty, Editor. New York: Interscience Publishers,* 1948 and 1949. Vol. I, 517 pp., $10.00, Vol. II, 1114 pp., $15.00.

These two volumes represent the largest American reference text in the field of industrial hygiene. It has been prepared by a group of 18 authors under the editorship of a man who has had extensive experience and contacts in the field of industrial hygiene.

Volume one presents the background of industrial hygiene, including records

and reports, industrial hygiene surveys, the sampling and analysis of atmospheric contaminants and, in addition, certain other subjects not usually found in industrial hygiene reference volumes, such as a detailed discussion of the problem of fatigue, the physiological effects of abnormal pressures, fire and explosion hazards of combustible gases, and dusts. The mode of entry and action of toxic materials is presented in a most complete manner. The section on radiant energy and radium by Dr. Curtis of the U. S. Bureau of Standards is a valuable summary of this most important subject.

Volume two is concerned with toxicology. Here, all of the important industrial toxicological agents are presented, including the metals, halogens, cyanides and cyanogen compounds, aromatic and cyclic hydrocarbons, amino compounds, nitro compounds. The toxicological section does not present a complete and systematic review of the literature of poisoning among industrial workers. In this respect, the present volume differs from that of Drs. Hamilton and Hardy entitled *Industrial Toxicology*. All of the substances treated in the second volume are presented in a somewhat uniform manner in which are set forth the uses and industrial exposures, the physical and chemical properties, methods for chemical determination, acute and chronic toxicity, absorption and excretion and finally, maximum permissible concentration in the atmosphere, where such information is available.

This book is primarily a reference book. It is not intended for the use of the physician in general practice but for persons interested in specific toxicological information and for industrial hygienists who will find these volumes of inestimable value. In litigation, particularly in compensation cases involving the occupational diseases caused by toxic agents, these volumes will find a favorable reception.

LEONARD GREENBURG

Evaluation Guide: An Outline for the Self-Evaluation of a Local Tuberculosis Association and Its Relation to the Tuberculosis Control Program—*New York: National Tuberculosis Association,* 1949. 71 pp. Price, $1.00.

This neatly devised publication has many interesting features and deserves to be put to wide use by local tuberculosis associations. Starting with four pages of instructions for its use, it is then divided into three major parts: administration and organization, fact finding, and program development. Part I on administration and organization is a series of well over 100 pertinent questions of the "yes-no" type. Part II is a combination of questions and tables for studying briefly certain social and economic data and general health facilities and services, and for an exhaustive study of the tuberculosis status and problems in an area. The third part consists of 13 pages which will greatly facilitate an association's job of setting-up a program to meet its needs.

This *Evaluation Guide,* like others in the social fields, when applied locally, is only as good as the honesty of the evaluators. It is, however, relatively complete in scope and has as much possibility as a teaching device as it has for the systematic gathering and evaluating of important and useful information on tuberculosis control.

ROBERT E. ROTHERMEL

Community Health Organization —*By Ira V. Hiscock. (4th ed.) New York: The Commonwealth Fund,* 1950. 278 pp. Price, $2.75.

Those concerned with broad community-wide planning for public health will welcome the new revision of this most useful book. First published in 1927, the last previous edition was in 1939. The very readable and concise method of presentation used before is retained, but extensive re-writing and

much valuable new material, including an excellent chapter on Medical Care Administration in Relation to Public Health, focus the discussion sharply on problems of a modern public health program.

An integrated plan is developed for services required for a hypothetical community of 100,000 population. Budgetary details are included with salaries and costs adjusted to present-day levels.

Five major health department administrative bureaus are recommended—administration (including health education, vital statistics, and records, and laboratories), preventable disease control, maternal and child health, public health nursing, and environmental sanitation—rather than the seven suggested in 1939.

The author's exceptionally broad experience in teaching, consultation, and survey work, and his long and useful association with the Committee on Administrative Practice of the American Public Health Association provide an authoritative background for a book of this type. It is planned for students, active workers in official and voluntary health agencies, and those concerned with community planning. It will be extremely valuable to all these groups.

HUGH R. LEAVELL

The Examination of Waters and Water Supplies—*By Edwin W. Taylor. (6th ed.) Philadelphia: Blakiston,* 1949. 819 pp. Price, $12.00.

This volume is the 6th Edition of a well known English reference, the original author of which was J. C. Thresh. Recent editions have been published with J. C. Thresh, J. F. Beale, and E. V. Suckling as the authors, all of whom are now deceased. The 6th Edition has been prepared by E. W. Taylor, Deputy Director of Water Examination, Metropolitan Water Board, London.

The traditional format of the work has been retained, but the contents have been brought well up to date, a number of chapters have been rewritten, simple descriptions of fungal and algal growths commonly found in water have been added, and the number of references to scientific literature has been markedly increased.

The book covers a very wide field, including geology in its relation to source of water supply; inspection of supplies; physical, biological, chemical, and bacteriological examination of water with details of analytical and cultural procedures; standards of water quality; and purification and treatment of water. A series of 24 plates illustrating microscopical and other organisms and a useful appendix containing directions for preparing reagents and culture media, various tables with other data complete the new edition of an authoritative and popular work.

Although much of the discussion of sources of supply, interpretation of results and standards is particularly applicable to waters in the British Isles, this volume constitutes an invaluable reference for every administrator, engineer, and laboratory worker who is concerned with water supply.

M. H. MCCRADY

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Very Personal Note — Deodorant soaps do help to control the odor of perspiration to a degree, and hexachlorophene—the stuff that does the trick—seems to detract from neither the elegance nor the safety of the soap.

ANON. Status Report on Deodorant Soaps. *J.A.M.A.* 142, 11:814 (Mar. 18), 1950.

Accidents Next? — After the high mortality of the neonatal period is passed, accidents and heart disease emerge as the chief causes of death in youth, though tuberculosis still leads both in the 15–19 year group. Old-timers must marvel that the contagious diseases of childhood now play so small a part (less than 1 per cent of deaths).

BAUMGARTNER, L., AND PESSIN, V. Current Problems in Deaths of Persons Under 20 Years of Age. *Pediatrics* 5, 2:257 (Feb.), 1950.

More Than Dietetics—A brief lesson in psychology. All people need pleasure. Some people have little pleasure in life apart from eating. Tension indicates unsatisfied wants. Eating relieves tension. Help the obese person find satisfactions for non-metabolic wants first. Then put him on his reducing diet.

BAYLES, S. Psychiatric Contributions to the Treatment of Obesity. *Am. J. M. Sc.* 219, 1: 104 (Jan.), 1950.

Coxiella burnetii—This is an extensive epidemiologic research in Q fever as it occurred about Los Angeles. Industrial workers who handle slaughtered cows and calves, the employees (in dairies) who process raw milk, and the people who drink it raw are the ones most commonly infected. Many of the infections were not recognized for what they were.

BELL, J. A., *et al.* Epidemiologic Studies of Q Fever in Southern California. *J.A.M.A.* 142, 12:868 (Mar. 25), 1950.

More Than Vitamins Involved—Which foods shall we "enrich" or "fortify" or "restore" with vitamins and minerals? For one who is more concerned about a "like-mother-used-to-make" taste to his bread than the partial restoration of nutrients removed, these soundly scientific considerations of the biochemical problems of vitamin and mineral replacement seem to have about them a slightly fishy odor—like liver oil substitutes.

COWGILL, G. R. Improving the Quality of Cheap Staple Foods. *J.A.M.A.* 142, 10:721 (Mar. 11), 1950.

Medical Care Again — Pros and cons, not necessarily equated, for the two national health proposals likely to receive attention—the FSA's measure and the Flanders-Ives-Herter-Javits Bill—are set forth in clear and fair detail. The wording of the paper's title seems a portent, considering whence it comes.

DAVENPORT, R. W. Health Insurance Is Next. *Fortune* 41, 3:63 (Mar.), 1950.

Required Reading — Chances are good that not more than one Bibliography reader in ten can rattle off the exact name of UNESCO. Probably only one in a hundred could outline its program, and scarcely one in a thousand (if there were that many readers) could tell how it is making out. Here's your chance to be one of the ones.

EISENHOWER, M. S. We—You and I—Are

UNESCO. *J. Home Econ.* 42, 3:175 (Mar.), 1950.

Conscientiousness You Seldom See—In the September, 1948, issue of our own *Journal,* Miss Howitt, *et al.,* reported upon the presence of a neutralizing antibody against Newcastle disease in the sera of children presenting certain clinical signs. Now, in a new paper she reports the detection of a nonspecific factor which, she holds, invalidates the earlier findings. Her work makes it apparent that this factor may influence other virus studies.

HOWITT, B. F. A Non-Specific Heat-Labile Factor in the Serum Neutralization Test for Newcastle Disease Virus. *J. Immunol.* 64, 2: 73 (Feb.), 1950.

Still Room for Improvement — Despite all our vaunted improvements in infant feeding, breast milk still remains the best product. Bottle or breast-fed babies need vitamin D and bottle babies need vitamin C, too. Commonest mistakes are giving too much D and not enough C and giving both too late.

JEANS, P. C. Feeding of Healthy Infants and Children. *J.A.M.A.* 142, 11:806 (Mar. 18), 1950.

What One County Society Does —Each week the health department sends a list of maternal deaths to the maternal welfare committee. A visit is made to the hospital and the doctor is invited to discuss the case at the next meeting. In eleven years the rate dropped from 63 to 6.8 per 10,000 births.

SCHAEFFER, G. Maternal Mortality in Queens County 1937–1949. *New York State J. Med.* 50, 5:545 (Mar. 1), 1950.

Mostly a Family Matter—You may enjoy this philosophic British discussion of old age problems which, the writer says, are fundamentally domestic. The job is to preserve independence as long as possible, assist families in the care of their aged dependents, and see that all old people who want to work are enabled to do so. Americans think in terms of institutional facilities; the British in terms of human relationships. "Old age," the writer observes, "is no solvent of obstinacy."

SHELDON, J. H. The Role of the Aged in Modern Society. *Brit. M. J.* 4649:319 (Feb. 11), 1950.

Parental Failures—If I had any immediate concern with child health matters I'd read every word of this symposium, even though my eyesight never recovered from the abuse. But I am not so concerned, hence I pass on the word that this 22 page round table (set in 8 point type—and in lines 5 inches long) begins with a good story and seems to continue its merry way with many a sage comment on parental foibles.

SHIRLEY, H. F., *et al.* Parent-Child Relationship in the Emotional Development of the Child. *Pediatrics* 5, 2:296 (Feb.), 1950.

"Not Too Encouraging" — You should read this, if only for its method of presentation. In his inimitable a, b, c, order, Stokes puts down the answers to questions about what the antibiotics have done to V. D. control. Then he asks: where do the weak spots lie? Methodically he works over objectives and obstacles, always looking for weak spots and then he asks what can be done about them? It is a pleasure just to watch this man's mind at work. Sidewalk superintendents are welcomed.

STOKES, J. H. The Practitioner and the Antibiotic Age of Venereal Disease Control. *J. Ven. Dis. Inform.* 31, 1:1 (Jan.), 1950.

Human Frailties — Some answers here to the question: why aren't more physical defects corrected after they are discovered in school health examinations? Mostly the defects are a matter

of teeth, tonsils, and eyes, and the relative influence of the attitudes of parents and pupils and conflicting medical judgments all vary with each category. Interesting.

SWANSON, M. Pupil or Parent. *Pub. Health Nursing* 42, 3:121 (Mar.), 1950.

Soul Searching — Philadelphia's social services (which affect tuberculosis patients and their families) were gone over with a fine tooth comb. Both official and voluntary agencies agreed that all the combed out fleas might be displayed for the benefit of other cities as well as for their own good. Courageous and farsighted, the personnel are termed.

TEAGUE, R. E. Study of Tuberculosis in Philadelphia (and) TAYLOR, R. B. Social Services for the Tuberculous and their Families. *Pub. Health Rep.* 65, 9:279 (Mar. 3), 1950.

The Air We Breathe—Seven useful discussions of air pollution and its prevention to add to your general store of information—useful, that is, unless you never take your nose from your office desk or lab table.

VAUGHAN, H. F. Introduction to Air Pollution Institute (and seven papers). *Indust. Med. and Surgery* 19, 3:95 (Mar.), 1950.

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

BOWERY TO BELLEVUE. Story of New York's First Woman Ambulance Surgeon. Emily Dunning Barringer. New York: Norton, 1950. 262 pp. Price, $3.00.

CANCER NURSING. New York State Department of Health, the National Cancer Institute and the Public Health Service, Federal Security Agency. Raleigh, N. C.: Health Publications Institute, 1950. 92 pp. Price, $1.00 ea., $80.00 per C, and $750.00 per M.

THE CHEMISTRY OF INDUSTRIAL TOXICOLOGY. Hervey B. Elkins. New York: Wiley, 1950. 406 pp. Price, $5.50.

CHILD TREATMENT AND THE THERAPY OF PLAY. Lydia Jackson and Kathleen M. Todd. (2nd ed.) New York: Ronald Press, 1950. 151 pp. Price, $2.50.

THE COMMON INFECTIOUS DISEASES. H. Stanley Banks. Baltimore: Williams & Wilkins, 1949. 354 pp. Price, $4.50.

CURRENT THERAPY—1950. Edited by Howard F. Conn, Philadelphia: Saunders, 1950. 736 pp. Price, $10.00.

THE ENVELOPE. A Study of the Impact of the World upon the Child. James S. Plant. New York: Commonwealth, 1950. 264 pp Price, $3.00.

EXHIBITIONISM. N. K. Rickles. Philadelphia: Lippincott, 1950. 198 pp. Price, $5.00.

HEALTH SERVICE AREAS. Joseph W. Mountin, Elliott H. Pennell, and Anne G. Berger. Washington: Gov. Ptg. Office, 1949. 89 pp. Price, $.45.

HOW TO BE HAPPY THOUGH YOUNG. George Lawton. New York: Vanguard, 1949. 300 pp. Price, $3.00.

LABORATORY MANUAL OF MICROBIOLOGY. George L. Peltier and Keith H. Lewis. New York: Macmillan, 1950. 176 pp. Price, $2.50.

LIGHT FOR MACHINING SMALL METAL PARTS. 14 pp. Price, $.50. Lighting for Wood Mills. 12 pp. Price, $.50. Lighting (Cannery). 34 pp. Price, $.50. New York: Illuminating Engineering Society, 1950.

MAKING THE GRADE AS DAD. Walter and Edith Neisser. New York: Public Affairs Committee. Public Affairs Pamphlet No. 157. 32 pp. Price, $.20.

NEW DISCOVERIES IN MEDICINE. Their Effect on the Public Health. Paul R. Hawley, 1950. 134 pp. Price, $2.50.

PRACTICAL STATISTICS IN HEALTH AND MEDICAL WORK. Ruth Rice Puffer. New York: McGraw-Hill, 1950. 238 pp. Price, $3.75.

THE PSYCHOLOGY OF EXCEPTIONAL CHILDREN. Karl C. Garrison (rev. ed.). New York: Ronald Press, 1950. 517 pp. Price, $4.50.

PSYCHOANALYSIS. EVOLUTION AND DEVELOPMENT. Clara Thompson. New York: Hermitage House, 1950. 252 pp. Price, $3.00.

PUBLIC HEALTH IS PEOPLE. Ethel L. Ginsburg. New York: Commonwealth, 1950. 236 pp. Price, $1.75.

RECENT ADVANCES IN SOCIAL MEDICINE. Alan Carruth Stevenson. Philadelphia: Blakiston, 1950. 241 pp. Price, $4.00.

RELATED SCIENCE FOR FOOD TRADES. University of the State of New York. Albany, N. Y.: Delmar Publishers, 1949. 163 pp. Price, $2.15.

RESEARCH IN MEDICAL SCIENCE. David E. Green and W. Eugene Knox. New York: Macmillan, 1950. 492 pp. Price, $6.50.

SOCIAL SECURITY LEGISLATION THROUGHOUT THE WORLD. Federal Security Agency, Social Security Administration. Washington: Gov. Ptg. Office, 1949. 176 pp. Price, $.75.

SOCIOLOGY OF THE PATIENT. Earl Lomon Koos. New York: McGraw-Hill, 1950. 264 pp. Price, $3.00.

SOME CONTEMPORARY THINKING ABOUT THE EXCEPTIONAL CHILD. Proceedings of a Special Conference on Education and the Exceptional Child of the Research Clinic of the Woods Schools. Langhorne, Pa.: The Woods Schools, 1949. 64 pp.

SOUTHERN BRANCH, AMERICAN PUBLIC HEALTH ASSOCIATION, PROCEEDINGS OF ANNUAL MEETING. Dallas, Tex., 1949. 51 pp.

STRUCTURE IN RELATION TO CELLULAR FUNCTION. Robert Chambers, Jean Brachet, Albert Claude, et al. New York: Annals of The New York Academy of Sciences, Vol. 50, Art. 8, pp. 815–1012.

TRAINING FOR CHILDBIRTH. Herbert Thoms. New York: McGraw-Hill, 1950. 114 pp. Price, $3.00.

TEXAS HEALTH PRACTICE INDICES, 1947–1948. Austin: Tex. State Department of Health.

TUBERCULOSIS. A GLOBAL STUDY IN SOCIAL PATHOLOGY. John B. McDougall. Baltimore: Williams & Wilkins, 1949. 455 pp. Price, $6.00.

Public Health in Foreign Periodicals

GEORGE ROSEN, M.D., PH.D.

REFERENCE in the press to the Union of South Africa is not infrequent. But such references are more likely to be concerned with problems of politics and economics—mandated territories, *apartheid,* mining, race riots—than with health. Nevertheless, South Africa has very important health problems, complicated in no small degree by its native and other non-white populations. For a brief but good survey of these problems the reader may refer to an article by G. W. Gale in the recently published *Handbook on Race Relations in South Africa.*[1] Gale points out that vital statistics are still lacking, or are unreliable, for the greater part of the population. Among the major problems are malnutrition, where the incidence ranges from 40 per cent for European schoolboys to 70 per cent for Bantu children. Probably the gravest health problem in the Union today is tuberculosis, in particular among non-Europeans. Venereal disease, malaria, and bilharzia are other important problems. Dental caries is enormously high. The kinds of ill health mentioned have their roots in ignorance and poverty, factors which in turn derive from the socioeconomic system with its rapid industrialization of non-European population groups. Nevertheless, the public health services have managed to achieve positive accomplishments. Malaria is being brought under more effective control. The incidence of leprosy is lower than in any other African territory. While health personnel is still not in adequate supply, a beginning has been made for the training of non-Europeans as doctors, nurses, medical aids, health inspectors, and social workers. One of the most hopeful signs is a new orientation toward health problems, indicated by the establishment of some 26 health centers staffed by 68 full-time medical officers. Similarly there has been set up an Institute of Hygiene which will train personnel and carry out research in the problems of social medicine as found in the Union.

POLIOMYELITIS AND SEWAGE IN JOHANNESBURG

The problem of poliomyelitis and its spread is of interest in South Africa no

less than in the United States. In the course of a systematic study of poliomyelitis, Gear and Measrock undertook to investigate the presence, persistence, and distribution of virus in the sewage purification plant of Johannesburg.[2] In this plant the sewage first passes through coarse screens and then into settlement tanks. The outflow from the settlement tanks flows by gravity on the sprinkler filter beds. The effluent from these filters then passes through humus tanks on to fine sand filters. The final effluent from these sand filters flows on to irrigate cultivated lands. The virus was proved to be in the settled sewage, but was not detected in the effluent from the sand filters. Investigation also showed that poliomyelitis virus was still present in the sewage nearly two months after the last known case of poliomyelitis had occurred in the area. Other methods of sewage disposal were also studied. The authors conclude, however, that their investigations showed little evidence to incriminate properly designed and supervised sewage purification plants in the spread of poliomyelitis.

THE YOUNG CHILD DEPRIVED OF NORMAL HOME LIFE

MacKenzie and Louw[3] discuss the social and legal aspects of young children who for one reason or another are removed from normal home life. At present there is in the South African Union a decided trend away from institutional care, especially in the case of the preschool child. Where possible, the cottage system is recommended because these smaller units allow for more individual care. Adoptions and the placement of children with foster parents seem to increase steadily. The authors emphasize the need for taking into account the child's interests as the primary factor in deciding upon the placement. Inquiries must be instituted to make certain that the adoptive or foster parents are healthy, mentally as well as physically. There should be a reasonable probability for normal development and the possibility of adjustment for the child in his new environment.

Crèches, particularly for European children are usually available only in larger cities. Only mothers who work during the day and who have a limited income are allowed to place their children in crèches subsidized by the government. Nursery schools are available, but little attempt has been made to bring parents, and particularly mothers, into closer contact with the methods and point of view of the nursery school.

The Children's Act of 1944 gives powers to medical officers of local authorities or of provincial administrations to insist upon the carrying out of medical treatment and even removal of a child for such treatment.

CHILD CARE IN INDIA

The subject of child care is also of current interest in India.[4] Recently the Bombay Children's Act of 1924 was revised and replaced by the Bombay Children's Act of 1948. D. V. Kulkarni, Chief Inspector of Certified Schools in Bombay Province, discusses this Act and points out how it has taken into account newer concepts in the field of welfare of socially handicapped children. Here too there is a desire to employ the foster home concept and an awareness of the greater need for individualization. Some of the difficulties in the way of full utilization of these ideas are discussed. First of all, there is the widespread poverty of the Indian masses. Second, Indian public opinion is not quite enlightened enough to accept a child whose antecedents are not known, or who comes from a different caste, or who is born out of wedlock. At present the efforts to break down such barriers are proceeding, and the authorities do from time to time resort to such methods to dispose of cases that come before them. The problem of displaced children is at

present engaging public attention and will very likely give impetus to the further implementation of these ideas.

CRUSADE AGAINST SOCIAL VICE

Another socio-medical problem of current interest in India is prostitution.[5] Banerjee points out the various measures by which this evil can be eradicated. While it is necessary to declare prostitution illegal, this is not enough. A complex of factors is usually associated with this phenomenon and these must be taken into account. The women must receive medical and social treatment and for this purpose special institutions are needed. It is necessary to have psychiatrists, psychologists, and trained social workers who understand all of the complex and subtle factors involved in the rehabilitation of prostitutes. An educational program, medical and psychiatric treatment, occupational retraining, and a change in public attitudes are required for successful solution of this problem.

NUTRITION OF SCHOOL CHILDREN

Nutrition surveys carried out in various parts of India have shown that the health of the average school child is unsatisfactory. The main underlying reason is to be found in the poor economic condition of the parents. To improve the situation, V. N. Patwardhan offers a program for the better nutrition of school children.[6] The two points that he stresses are nutrition education and school meals. The latter is of immediate concern, and steps should be taken to institute school meal programs. Place should also be made in the school curricula for nutrition education. These two activities would actually enhance each other. In addition, the author proposes that an efficient school medical service be set up to carry out periodic examinations to check on the results obtained from the introduction of school meals.

MALARIA CONTROL IN BOMBAY PROVINCE

Malaria is one of the great scourges of India, and determined efforts have been made in recent years to control it. The malaria organization in Bombay Province was started in 1942, and since then has carried on a steady program of research, survey, and control.[7] This organization consists of an Assistant Director of Public Health and an Entomologist in charge of the program, as well as several field units. It was hoped to have a malaria engineer but so far this position has not been filled.

At present malaria control measures are being carried out in six districts; the total population covered is approximately 5 million. Within the next two years, it is expected that the projected surveys will have been completed. It should then be possible within a period of three to four years to include the entire population of 30 millions within the program of malaria control.

HEALTH SERVICE IN INDUSTRY

Industrial hygiene is only in its beginnings in India. M. N. Gupta discusses modern trends in industrial medicine and industrial health practice.[8] He points out that in India the problem of silicosis has been tackled only in the Kolar gold fields where, since the introduction of regulations in 1940, 2,834 cases have been reported. In coal mining this problem has not even been considered as yet.

DENTISTRY IN INDIA

Various actions have been taken recently to advance dentistry in India and to make it more capable of rendering the services so badly needed by the Indian masses. N. N. Bery, surveying the highlights of 1948 called attention to the following.[9] In February, 1948, Parliament passed the Indian Dentists Act regulating the practice of dentistry. Another item of importance was the establishment of the Central Publicity

Health Bureau, which has as its objective the dissemination of health knowledge. Another fact worthy of note is the program for granting scholarships to dental students so that they may study in the United States or in the United Kingdom.

In May, 1949, the Dental Council of India was inaugurated at New Delhi by the Minister of Health.[10] The Minister pointed out that the total number of qualified dentists is estimated to be only 1,000. One of the major needs is the promotion of dental education. The Council appointed a committee to draw up a curriculum for dental colleges.

CHILD GUIDANCE IN CEYLON

A dominion not often seen in the health news is Ceylon. It may therefore be instructive to glance at a few of the health matters that are being discussed there. The issue of the *Ceylon Health News* (April–June, 1948) is devoted entirely to child guidance.[11] It is worth noting that since 1947 there is in operation a Child Guidance and Psychiatric Clinic at the General Hospital in Colombo. The clinic is in charge of a psychiatrist who is assisted by a trained psychiatric social worker. The clinic is held two afternoons a week, at which time patients are seen by the psychiatrist. On all mornings of the week the psychiatric social worker is present at the clinic to interview patients and to implement the treatment prescribed by the psychiatrist. On three afternoons the social worker visits the home, school, or place of work of patient. In the same issue of *Ceylon Health News*, Dr. I. A. Senanayake, the psychiatrist in charge of this clinic, discusses various aspects of mental health.

The Annual Sanitary Inspector's Conference met in December, 1948. A report of this meeting appears in the *Ceylon Sanitary Inspector*.[12] C. T. Williams, Assistant Director of Sanitary Services, reviewed the health problems of Ceylon and indicated the different types of health work which the Sanitary Inspector is called upon to perform.

Among the problems discussed are nutrition, sanitation, water supply, housing, school health work, and control of such diseases as malaria, filariasis, and tuberculosis. The Sanitary Inspector is expected to work on these matters in close coöperation with the local authorities, particularly the village committees of which there are 400 in Ceylon. The population of Ceylon numbers 7 million, and most of the people live in rural areas. The Village Committees Ordinance recently passed has given the local authorities considerable power to initiate and carry out public health measures for the promotion of health. The chief responsibilities of the local bodies concern sanitation, water supply, markets, cemeteries, parks, maintenance of village roads, and licensing of such establishments as bakeries and tea shops.

PUBLIC HEALTH ORGANIZATION IN VIET NAM

Viet Nam has recently figured prominently in the press, but not for public health reasons. Yet it has important health problems that will require solution under any government. These problems are discussed in a very interesting monograph by P. H. Dan.[13] After reviewing the history and past experience of this troubled land, Dan offers a plan for reorganization of public health services. He emphasizes preventive activities, decentralization of service, and intensive health education.

EPIDEMIC GASTROENTERITIS IN JAPAN

As the reader may have noticed, we have moved in the course of this review from the southern tip of Africa northward to India, thence across the Indian Ocean by way of Ceylon to Indochina, and now we shall turn northward once more for a brief glimpse at Japan.

From January to about May, 1948,

a cholera-like disease was observed in various districts of Japan.[14] The initial symptoms were fatigue, thirst, and nausea. Then followed severe watery diarrhea. Abdominal pain was slight. In some cases the nausea led to vomiting. In serious cases there were 10 to 20 stools a day. The discharge was watery, unmixed with blood or mucus. Adults were observed to be more susceptible than children, and deaths occurred only in old people. Believing this to be a hitherto undescribed disease entity, Yamamoto and others investigated its etiology. On the basis of his studies, he concludes that it is caused by a filterable virus and has no direct relation to food and toxins. Bacterial study was negative. The incubation period is 1.5–4.5 days. Infection apparently occurs *per os*, but other routes have not been excluded. In animal experiments it was possible to transmit the disease only to cats.

Kojima and his coworkers have also studied the disease using 63 human volunteers.[15] Here too it was determined that the disease was due to a filterable agent. It was found that the filterable agent persists in the stools of convalescents for at least 7 days and in some cases much longer. Recovery is followed by an acquired immunity. The causative agent was not found in the blood or the urine. Further reports will be made later.

CHEMOTHERAPY OF TUBERCULOSIS

Hasegawa[16] reports on experiments with cepharanthin, an alkaloid extracted from *Stephania cepharantha* of the Formosan Menispermaceae. The substance has an inhibitory effect upon the formation of tubercles in experimental tuberculosis of guinea pigs. Cepharanthin was applied clinically to tuberculous patients at various times since 1937. The author also presents evidence to show that it cures leprosy. The results presented do not stand up well under critical scrutiny.

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ASSOCIATION NEWS

SEVENTY-EIGHTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
ST. LOUIS, MO., OCTOBER 30–NOVEMBER 3, 1950

FELLOWSHIP IN THE AMERICAN PUBLIC HEALTH ASSOCIATION

The grade of Fellowship was established in the American Public Health Association in 1922. Professional workers in public health are eligible for election as Fellows under certain conditions and as an indication that they have achieved a recognized professional standing. As of January 1, 1950, the total membership of the Association was 11,561, including 2,255 Fellows, or 19 per cent of the total.

Questions are frequentliy asked regarding the requirements for Fellowship and the following statement outlines the provisions of the By-laws governing qualification and election.

Persons who have been members of the Association for at least two years and who have reached their 30th birthday are eligible to apply if, in their opinion, they meet the conditions of one or more of the six clauses in the By-laws defining "an established professional standing." These six possible approaches are as follows:

a. A person who has rendered acceptable service for two or more years in a responsible public health position and who has been awarded in course a degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, Doctor of Medicine, with at least one year of graduate study in public health in a university, Master of Public Health, Diploma in Public Health, or other equivalent degrees, according to standards approved by the Executive Board of the American Public Health Association.

b. A person who has been awarded in course an academic or professional degree involving training in public health and who has been regularly engaged in health work for at least five years, having rendered meritorious service as a health officer or in responsible charge of work in either a public or private health agency.

c. A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing.

d. A person regularly engaged in health work for at least five years, who has given evidence of special proficiency, who has attained a recognized standing.

e. A teacher of public health or one of its constituent sciences who has attained distinction as an expounder of the principles of public health or its constituent sciences. Such a teacher shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs "b" and "d" that the applicant may have had shall be considered the equivalent of the same number of years' experience as a "teacher."

f. A person not covered by the above, who has made substantial contributions to public health work in his chosen branch, who has attained a recognized professional standing.

Persons wishing to apply should request a Fellowship application blank from the American Public Health Association Membership Department, 1790 Broadway, New York 19, N. Y. Applications are accepted up to August 1 each year for consideration by the Governing Council at the fall meeting. It is important to make clear that mem-

bers themselves should take the initiative in submitting such applications. Neither the Sections nor the A.P.H.A. administrative staff are authorized to solicit applications. This means that, although over 3,000 persons have been duly recognized with this grade of affiliation since 1922, there are other persons well qualified who have never initiated the process of applying for Fellowships. It should be clear that members should not await action by others if they wish to attain Fellowship. It is necessary and proper for them to take the first step.

An application for Fellowship requires sponsorship by two Fellows of the Section with which the applicant desires to be affiliated. These personal signatures are to be obtained by the applicant before submitting the completed application. The A.P.H.A. office will assist, on request, in determining the Section with which prospective sponsors are affiliated. Applications from persons not wishing to be identified with a particular Section and requesting unaffiliated Fellowship may be sponsored by any two Fellows of the Association.

When properly sponsored and otherwise completed, the application is sent to the A.P.H.A. office, after which the list of persons applying is published in the *American Journal of Public Health*, usually in the September issue, but in any case not less than 15 days before the date for the Annual Meeting. An established routine is followed for review by the Section Councils (unaffiliated applications are reviewed by the Executive Board) and by the Committee on Eligibility. This Standing Committee of the Association is made up of one Fellow from each of the 13 Sections, plus a Chairman elected by the Executive Board. This group is under instructions from the Governing Council to examine each application in accordance with the provisions of the clause of the By-laws chosen by the applicant, and to apply the criteria with precision in each case. Final election is by the Governing Council at the second meeting at each annual session.

The privileges of Fellowship include eligibility to serve as an officer of the Association or one of the Sections, Chairman of an Association or Section Committee (over one hundred in number), a member of one of the four Standing Committees, a member of the Governing Council or Executive Board, and the right to vote for the elective members of the Governing Council and on amendments to the Constitution. Some Civil Service and merit system records depend upon Fellowship in the American Public Health Association as an achievement deserving recognition in applicants.

The dues of Fellows are $12.00 annually, and include a subscription to the *American Journal of Public Health* and other services to which members are eligible. Life membership is available at $200, covering all future annual dues.

Applications for Fellowships to be considered at the 78th Annual Meeting in St. Louis, Missouri, October 30–November 3, should be filed with the Association as soon as they are completed, and in any case not later than August 1. For further information, address the Membership Department, American Public Health Association.

THE 78TH ANNUAL MEETING

St. Louis, Mo., Oct. 30–Nov. 3, 1950

Hotel Reservation Form

The hotels listed below have rooms available for Association delegates at the rates indicated. Please note that no RESERVATIONS WILL BE ACCEPTED DIRECTLY BY HOTELS. Make your reservations through: *HOTELS CONVENTION RESERVATION BUREAU, A.P.H.A., Room 406, 911 Locust St., St. Louis 1, Mo.*

Hotel	*Single Rooms*	*Double Rooms*		*2 Room Suites*
		Double Bed	*Twin Beds*	*Parlor & Bedroom*
American	$2.75–$4.00	$3.50–$5.00	$4.00–$5.00	$8.00
Baltimore	2.75– 3.50	3.75– 4.50	4.00– 5.00	
Broadview	3.00– 6.00	4.50– 7.00	6.00– 8.00	12.00–18.00
Chase	4.00– 8.00	6.00– 8.00	6.00–10.00	10.00–35.00
Claridge	3.25– 4.75	5.00– 7.50	5.50– 7.50	12.00 & up
Congress	4.50– 6.00	6.50– 8.00	6.50– 8.00	12.00–15.00
De Soto	3.50– 5.00	5.50– 8.00	7.00–13.00	12.00 20.00
Forest Park	3.50– 5.00	5.00– 7.00	6.50 & up	10.00 & up
Gatesworth	4.00 & up	5.00 & up	5.00 & up	10.00 & up
Jefferson	4.50– 6.50	6.00– 8.00	7.50– 8.50	12.00–22.50
Kingsway	3.00– 4.00	4.50– 7.00	6.50– 7.00	
Lennox	3.75– 6.00	5.25– 8.00	6.50– 8.00	11.00 & up
Majestic	3.00– 5.00	4.00– 6.00	6.00– 8.00	
Mark Twain	3.25– 5.00	5.00– 7.00	6.50– 7.00	
Mayfair	3.50– 8.50	7.00–10.00	8.00–10.00	12.00–20.00
Melbourne	4.00– 6.00	5.00– 7.50	6.50– 8.00	12.00 & up
Park Plaza	5.00– 9.00	6.00–10.00	7.35–11.00	9.00–30.00
Roosevelt	3.50– 5.00	5.25– 8.50	7.50–12.00	16.50–19.50
Sheraton	4.00– 6.00	3.80– 5.00	6.00	
Statler	3.75– 6.50	4.50– 5.00	5.50– 7.00	
Warwick	2.75– 3.25	5.00– 9.50	7.00 & up	14.00 & up
York	3.00– 4.00	6.00– 8.00	7.00– 9.00	12.00–17.00

Single Rooms are limited: share a twin bedded room with a fellow delegate. Be sure to use the form below giving the Hotels Convention Reservation Bureau the complete information asked for. This will eliminate unnecessary correspondence for you and the Bureau. All reservations will be acknowledged by the Bureau; and confirmed by the Hotel to which you have been assigned by September 1.

ALL RESERVATIONS MUST BE RECEIVED PRIOR TO: September 18, 1950

Hotels Convention Reservation Bureau, A.P.H.A.
Room 406 — 911 Locust St.,
St. Louis 1, Mo.

Please make hotel reservation as indicated below:

First Choice ..... **Second Choice** ..... **Third Choice** .....
(Be sure to give three choices of hotels)
Single Room ..... **Double Bedroom** ..... **Twin Bedded Room** .....
2 Room Suite ..... **Other Type Room** .....
Rate from: $..... **to $**.....
The name(s) of the occupant(s) of the room will be: .....
.....
.....
Arrival at Hotel ..... **hour** ..... **A.M.** ..... **P.M.** .....
(date)
Departure ..... **hour** ..... **A.M.** ..... **P.M.** .....
(date)

***PLEASE NOTE*: Hotel accommodations will be held until 6:00 p.m.; later if deposit is made with notification.**

Name .....
(Individual Requesting Reservation(s))

Address .....

City and State .....

If the hotels of your choice are unable to accept your reservation the Hotels Convention Reservation Bureau will make as good a reservation as possible elsewhere providing that all hotel rooms available have not already been taken.

NOMINATIONS FOR THE GOVERNING COUNCIL

The Association Nominating Committee for Elective Councilors reports the following nominations for the Governing Council, in accordance with Section 2, Article VII, of the By-laws, which provides for publication of these names to the Fellowship not less than five months before the Annual Meeting.

The Nominating Committee is composed of one Fellow elected by each Section and a Chairman appointed by the Executive Board. The Chairman is Ruth Freeman, R.N., Administrator of Nursing Service, American Red Cross, and the other members are: Gaylord W. Anderson, M.D., Epidemiology Section; Marjorie L. Craig, School Health Section; Harold D. Chope, M.D., Health Officers Section; Edwin F. Daily, M.D., Medical Care Section; H. Shirley Dwyer, D.D.S., Dental Health Section; W. Thurber Fales, Sc.D., Statistics Section; John F. Mahoney, M.D., Laboratory Section; A. Helen Martikainen, Public Health Education Section; Ethel A. Martin, Food and Nutrition Section; William J. McConnell, M.D., Industrial Hygiene Section; Lucille Perozzi, R.N., Public Health Nursing Section; Blucher A. Poole, C.E., Engineering Section; and Edith P. Sappington, M.D., Maternal and Child Health Section.

The By-laws further provide that "upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to the nominees selected by it, provided such petition is received not less than three months before the annual meeting." This means that names will be added to the following list if properly supported by petition and received in the Administrative Office not later than July 30.

Official ballots containing the names of the following nominees and any added by petition will be mailed to all Fellows in good standing early in August. The ten nominees receiving the highest number of votes on the ballots cast by the Fellows will be declared elected to fill the three year term expiring in 1953.

Jessie M. Bierman, M.D.
University of California
Berkeley, Calif.

Philip E. Blackerby, Jr., D.D.S.
W. K. Kellogg Foundation
Battle Creek, Mich.

Irving H. Borts. M.D.
State Hygienic Laboratory
Iowa City, Iowa

Ruth E. Boynton, M.D.
University of Minnesota
Minneapolis, Minn.

William A. Brumfield, Jr., M.D.
State Department of Health
Albany, N. Y.

Clara E. Councell, Ph.D.
U. S. Children's Bureau
Washington, D. C.

Judith A. Davies, R.N.
Santa Barbara County Health Dept.
Santa Barbara, Calif.

Vivian V. Drenckhahn, M.P.H.
National Tuberculosis Association
New York, N. Y.

Theodora A. Floyd, R.N.
State Department of Public Health
Atlanta, Ga.

Albert S. Gray, M.D.
State Department of Health
Hartford, Conn.

John M. Hepler, C.E.
State Department of Health
Lansing, Mich.

Katharine F. Lenroot
U. S. Children's Bureau
Washington, D. C.

Basil C. MacLean, M.D.
Strong Memorial Hospital
Rochester, N. Y.

Frederick D. Mott, M.D.
Provincial Department of Health
Regina, Sask., Canada

Ralph S. Muckenfuss, M.D.
City Department of Health
New York, N. Y.

Hugo Muench, Jr., M.D.
Harvard University
Boston, Mass.

J. T. Phair, M.B.
Provincial Department of Health
Toronto, Ont., Canada

Carl L. Sebelius, D.D.S.
State Department of Health
Nashville, Tenn.

John W. Shackelford, M.D.
State Health Department
Oklahoma City, Okla.

W. G. Smillie, M.D.
Cornell University
New York, N. Y.

Ernest L. Stebbins, M.D.
Johns Hopkins University
Baltimore, Md.

Margaret S. Taylor, R.N.
University of Minnesota
Minneapolis, Minn.

Eunice N. Tyler, Ph.D.
University of North Carolina
Chapel Hill, N. C.

Felix J. Underwood, M.D.
State Board of Health
Jackson, Miss.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Waldo G. A. Edelman, M.D., Kanto C. A. Region, APO 500, PM, San Francisco, Calif., Public Health Officer, Kanto Civil Affairs Region.

Gaston Gonzalez, M.D., Hospital Trudeau, Santiago, Chile, S. A., Specialist in Tuberculosis.

Daniel A. Halferty, M.D., Box 516, Toledo, Ore., Deputy Health Officer, Lincoln-Tillamook District Health Dept.

Roy O. Hawthorne, M.D., Route 1, Box 152, St. Petersburg, Fla., Chief of Professional Services, V. A. Center.

Sidney S. Heilweil, M.D., 5813–18th Ave., Brooklyn 4, N. Y., Surgeon (R) U.S.P.H.S.

Bernard Jean-Paul, M.D., Bard Hall, 50 Haven Ave., New York, N. Y., Student of Public Health, Columbia Univ.

R. E. Johnson, M.D., 1012 Austin, San Angelo, Tex., Director, Health Unit Tom Green County.

Robert M. King, M.D., D.P.H., 16 Colborne St., East, Orillia, Ont., Canada, Asst. Medical Officer of Health, Simcoe County Health Unit

John W. Lentz, M.D., 800 S. 48th St., Philadelphia 43, Pa., Asst. Chief, Division of Venereal Disease Control Philadelphia Dept. of Public Health

Hubert T. Marshall, M.D., 115 South Maple Ave., Martinsburg, W. Va., Director, Tri-County Health Dept.

Elizabeth Rowland-Aplin, M.D., 210 West High Ave., New Philadelphia, Ohio, Commissioner, Tuscarawas County General Health District

Frank D. Ryder, M.D., State Health Dept, Lincoln, Neb., Director of Health

Armando M. Silva, M.D., 1107 South State St., Ann Arbor, Mich., Medico Sanitarista, Secretaria Saude Assistencia

J. A. Sims, M.D., Health Dept., Talladega, Ala., Health Officer, County Health Dept.

Clayton M. Steward, M.D., M.P.H., Paul Smith Bldg., Saranac Lake, N. Y., District Health Officer, New York State Dept. of Health

Francis E. Tierney, M.D., City-County Health Center, P. O. Box 1228, Panama City, Fla., Bay County Health Officer

Laboratory Section

Ann Louise Anderson, B.S., 4 Liberty St., Apt. 5, Pontiac, Mich., Bacteriologist, Pontiac Dept. of Public Health

Margaret M. Cook, B.S., 1417 Smith Tower, Seattle, Wash., Principal Bacteriologist, Washington State Dept. of Health

Jose A. Espinosa, M.D., Laboratorio Central del SCISP, Cochabamba, Bolivia, S. A., Director

I. Charlotte Grossmann, B.S., 3618 Courtland Place, Seattle 14, Wash., Bacteriologist, Washington State Dept. of Health

Vivian Harris, M.S., 831 Chouteau Ave., St. Louis, Mo., Technician, Ralston Purina Co.

Ralph B. Hogan, M.D., M.P.H., P. O. Box

185, Chamblee, Ga., Chief, Laboratory Services, Communicable Disease Center, U.S.P.H.S.

Ronald S. Martin, Ph.D., Pathology Dept., Darwin Hospital, Darwin, N. T., Australia, Officer in charge of Pathology Dept.

Jessie G. McCormick, A.B., 3096 Northern Blvd., Manhasset, L. I., N. Y., Director, Manhasset Clinical Laboratory

Theodore N. Morner, B.S., 419 Greenleaf Ave., Glencoe, Ill., Senior Water Bacteriologist, South District Filter Plant

Questa G. Mountain, B.S., 1221 East 61 St., Seattle 5, Wash., Principal Bacteriologist, Washington State Dept. of Health

Inka O'Hanrahan, A.B., 350 Post St., San Francisco, Calif., Director, Medical Service Laboratory

Charles H. Rammelkamp, Jr., M.D., 3034 Berkshire Rd., Cleveland, Ohio, Assoc. Professor of Preventive Medicine, Western Reserve Univ., School of Medicine

Billy B. Taylor, 1437 N. E. 10th, Oklahoma City, Okla., Asst. Serologist, Oklahoma Dept. of Health

James C. Wilson, M.S., 816 W. 8th, Topeka, Kans., Senior Bacteriologist, Kansas State Board of Health

Statistics Section

Clair L. Chism, 4851 Calvert St., Lincoln, Neb., Director, Bureau of Vital Statistics

Selma S. Roles, P. O. Box 614, Mingo County, Williamson, W. Va., Local Registrar of Vital Statistics

Engineering Section

John G. Ault, M.P.H., 1301 Lanier Blvd., Atlanta, Ga., Sanitarian (R), U.S.P.H.S.

B. D. Baker, B.S. in C.E., 305 City Hall, Omaha, Neb., Director, Division of Sanitation, County Health Dept.

Eloy A. Barreda, B.S., United States Embassy, LaPaz, Bolivia, S. A., Chief, Engineering Division in Bolivia, Institute of Inter-American Affairs

Frank E. Bruce, M.S., City & Guilds College, Civil Eng. Dept., Exhibition Rd., London S. W. 7, England, Rockefeller Lecturer in Public Health Engineering

Frank A. Butrico, M.S., 45 Emeline St., Waltham, Mass., Sanitary Engineer, U.S.P.H.S.

Domenico Caporale, B.A., 5017 N. 23rd St., Omaha, Neb., Sanitarian, Omaha-Douglas County Health Dept.

Israel Fitterman, M.S.P.H., 25 Evelyn Way, N. W., Atlanta, Ga., Student, School of Public Health, Univ. of North Carolina.

Gilberto Gomez-Laurens, 907 E. Huron, Ann Arbor, Mich., Student, Univ. of Michigan

Carlos Jose Hilburg, Colon 164, Callao, Peru, S. A., Chief of Sanitary Engineering Dept., Arequipa, Peru, Public Health Bureau, Rockefeller Foundation

George L. Jacobson, B.S., School of Mines and Technology, Rapid City, S. D., Asst. Professor of Sanitary Engineering

John A. Kaufmann, A.B., 2431 College Ave., Berkeley 4, Calif., Student, School of Public Health, Univ. of California, School of Public Health

Alison J. Kirby, 214 15th Ave., East, Cordele, Ga., District Public Health Engineer, Crisp-Worth Health District

John E. Lemming, 695 West Mill St., Danville, Ind., Sanitarian, State Board of Health

Willis H. Lewis, M.S., 420 6th Ave., N., Nashville 3, Tenn., Principal Engineer, Division of Sanitary Engineering, Tennessee Dept. of Public Health

Eugene Limousin, C.E., School of Public Health, Univ. of Minnesota, Minneapolis, Minn., Sanitary Engineer, Societe Coöperative Inter-American Sante Publique

Walter A. Lyon, M.S., Div. of Engineering Resources, F.S.A., P.H.S., Washington 25, D. C., J. A. Sanitary Engineer

Carlos Mantilla-Fernandini, Grau 730, La Punta, Callao, Peru, S. A., Chief of Sanitary Engineering Dept., Chiclayo, Peru Unidad Sanitaria Dept.

Irel S. McQueen, B. S., State House, Room 422, Boise, Ida., Asst. Public Health Engineer, Idaho Dept. of Public Health

William H. Meyer, B.S., 362 S. 12th St., Apt. 2A, Richmond, Calif., Student, Univ. of California

H. E. Parker, B. S., City-County Health Dept., Winston-Salem, N. C., Director of Inspections Division, Winston-Salem Forsyth County Health Dept.

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Annie Perez, Luis Munoz Rivero 5, Yauco, Puerto Rico, Physical Therapist, State Insurance Fund

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Frank W. Lowenstein, M.D., 124 W. Lincoln Ave., Worthington, Ohio, Surgeon (R), U.S.P.H.S., Medical Officer in charge of Nutrition Study Unit, Columbus, Ohio

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Maria Adela Valentin, M.A., Fortaleza 351, San Juan, Puerto Rico, Teacher Trainer in Home Economics Education

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Robert D. Wright, M.D., M.P.H., U.S.P.H.S., Div. of V.D., Washington, D. C., Chief, Section of Technical Aids and Services, Division of Venereal Diseases, U.S.P.H.S.

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CHANGES IN THE COMMITTEE ON PROFESSIONAL EDUCATION

The Executive Board has appointed Leroy E. Burney, M.D., M.P.H., as the new Chairman of the Committee on Professional Education. Dr. Burney succeeds Dr. William P. Shepard who, under the Constitution and By-laws of the Association, has become ineligible for the Chairmanship of the Committee on Professional Education in view of his office as President-Elect.

Dr. Shepard served the Committee on Professional Education for 10 years, and his contribution has been outstanding. The Merit System Service, the accreditation of schools of public health, the Vocational Counseling and Placement Service, salary studies and recommendations, and 13 new reports on educational qualifications were among the projects which came into being under his guidance and leadership. Many others were initiated by him and are yet to be carried to completion.

Dr. Burney received his B.S. and M.D. degrees from the University of Indiana and his M.P.H. degree from Johns Hopkins University. He was an officer in the Commissioned Corps of the U. S. Public Health Service from 1937 to 1945 when he became State Health Commissioner of Indiana. As Commissioner, Dr. Burney has taken an active part in the affairs of the Association of State and Territorial Health Officers of which he is now Secretary-Treasurer. He is deeply interested in recruitment and field training of public health personnel—two projects which are currently of great importance in the work of the Committee on Professional Education.

In addition to the new Chairman, there are two new members on the Committee on Professional Education: Edmund K. Kline, Dr.P.H., Director of Laboratories, Cattaraugus County Department of Health, Olean, N. Y., and Dean F. Smiley, M.D., Secretary, Association of American Medical Colleges, Chicago. They are taking the places of Wilson G. Smillie, M.D., and Huntington Williams, M.D., whose terms of appointment had expired. Hugo Muench, M.D., of the Harvard School of Public Health and Ella E. McNeil, R.N., of the University of Michigan, School of Public Health, were reappointed to the committee to succeed themselves.

The first meeting of the Committee on Professional Education under Dr. Burney's Chairmanship is scheduled for May 19, 1950, in New York City.

PROJECT ON ACCREDITATION OF FIELD TRAINING AREAS

The American Public Health Association is undertaking a project for the accreditation of field training areas for public health personnel under the

auspices of the Committee on Professional Education, Leroy E. Burney, M.D., Chairman. A three year grant for the financial support of this project has been obtained from the W. K. Kellogg Foundation. The services of Dr. Haven Emerson have been secured as consultant for the project and a conference of a small group of leaders in the public health field was called in Ann Arbor, Mich., on April 19 and 20 to help map out the steps along which the project will be conducted.

Tentative initial plans include:

a. A review of the scope, organization, content and quality of training programs now in operation
b. Definition of the desirable content and duration of training for public health physicians, public health nurses, engineers, health educators and sanitarians
c. Devising an application form to be used by state health departments in applying for accreditation of field training programs
d. Developing an evaluation schedule for such training facilities
e. Study of existing manuals of training curricula and the supervision of trainees

The Association has had a long-standing interest in the quality of field training which has finally led to the establishment of a comprehensive plan and project. The Committee on Professional Education and its Subcommittee on Field Training for years has given considerable thought to the principles of field training and has made a fundamental contribution by formulating the Report on Field Training of Public Health Personnel under a subcommittee of which Gaylord W. Anderson, M.D. was chairman, which report was approved by the Governing Council in 1947. In 1948 the Subcommittee on Field Training drew up suggested criteria for residency experience for physicians which were adopted by the American Board of Preventive Medicine and Public Health, Inc. That body asked the American Public Health Association to undertake responsibility for the evaluation of the quality of such residency experience and, in 1949, the American Public Health Association Executive Board, upon recommendation of the Committee on Professional Education, voted to adopt the principle of the Association's responsibility for the accreditation of field training areas.

The project of accreditation of field training areas parallels the Association activity of accreditation of schools of public health which has been under way for five years.

NEWS FROM A.P.H.A. AFFILIATED SOCIETIES

Puerto Rico Public Health Association

The 9th Annual Meeting of the Puerto Rico society of health workers was held in the School of Tropical Medicine at San Juan, February 8 to 11. Program participants from the states were: Drs. Leona Baumgartner, Marcia Cooper, W. G. Hollister, John J. Phair, Grant Husband, and Miriam Whitaker.

A number of new memberships and membership renewals were collected during the meeting by the Secretary and forwarded to the A.P.H.A. office.

New officers were elected as follows:

President: Manuel Perez, P. R. Office of Personnel, San Juan
President-elect: Francisco Berio, M.D., Health Unit, Comerio
Vice-President: Nelson Biaggi, School of Tropical Medicine, San Juan
Secretary: Carmen Acevedo, School of Tropical Medicine, San Juan
Assistant Secretary: Ixia Sifontes, Department of Education, San Juan
Treasurer: Adelina Burgos, P. R. Health Department, San Juan
A.P.H.A. Governing Council Representative: Angel M. Marchand, M.D., P. R. Health Dept., San Juan

Washington State Public Health Association

This Affiliated society in the State of Washington has reported that the following officers were elected at its 14th Annual Meeting in Spokane in October.

President: Edith L. Mitchell, Tacoma-Pierce County Health Dept., Tacoma
President-elect: Marjorie Eastabrooks, State Dept. of Public Instruction, Olympia
Vice-President: E. L. Van Aelstyn, M.D., Public Health Dept., Kelso
Secretary: Sam I. Reed, Bremerton-Kitsap County Health Dept., Bremerton
Treasurer: Aileen Tuttle, Seattle-King County Health Dept., Seattle

The W.S.P.H.A. has decided to hold its 1950 Annual Meeting in conjunction with the forthcoming meeting of the Western Branch, American Public Health Association (Portland, Oregon, May 30 to June 1).

LOCAL HEALTH DEPARTMENT

Comments from the members are beginning to be received regarding the statement "The Local Health Department—Services and Responsibilities" published in the January number of the *Journal*.

The draft was published for the purpose of securing full discussion and membership comment before bringing it to the Governing Council. Criticisms and suggestions from as large a number as possible is earnestly desired by the Committee on Administrative Practice. Please send yours in promptly.

Fulbright Educational Program

Under the Fulbright Act of 1946 the U. S. Department of State is authorized to use certain credits and currencies acquired through the sale of surplus property abroad for educational exchanges. Its Board of Foreign Scholarships makes the final selection of all candidates. However, it uses a number of agencies through which to channel applications.

The foreign applicant to study in the United States applies to the United States Educational Foundation or Commission, normally established in the capital city of the participating country and readily located through the American Embassy in that city. Candidates are reviewed and nominations submitted of those recommended for awards. Agreements for carrying on this program have been signed with 15 countries: Australia, Belgium and Luxembourg, Burma, Egypt, France, Greece, India, Iran, Italy, The Netherlands, New Zealand, Norway, The Philippines, Turkey, United Kingdom and British Colonial Dependencies. Programs have not yet been initiated in all of them.

Applications of American students wishing to study in one of these countries are channeled through one of four agencies as follows:

For graduate study: Institute of International Education, 2 West 45th St., New York 19, except for students now enrolled in American colleges and universities who should apply to the Fulbright Program Advisers on their campuses.

For teaching in national elementary or secondary schools abroad: U. S. Office of Education, Washington 25, D. C.

For teaching in American elementary or secondary schools abroad: The American Council on Education, 744 Jackson Place, Washington 6.

For university teaching, lecturing, or advanced research: The Conference Board of Associated Research Councils, 2101 Constitution Ave., N.W., Washington 25.

Applications are closed for the academic year 1950–1951. For that year about 1,000 openings have been made available each to U. S. and to foreign nationals. Perhaps a quarter of them will be in medical or public health and related fields.

For the year 1951–1952 application information will be announced in the late summer or fall of 1950.

A.P.H.A. membership application blank on page XXIX

EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

POSITIONS AVAILABLE

Public Health Medical Officers—2 years' experience in medical practice required for Grade 1; 3 years' public health medical experience in public health agency for Grade 2. Starting salaries $6,060 and $6,672 annually. California license or eligibility to secure same. Civil Service examination to be held nation-wide. Application must be on official form by June 1. Recruitment Section, Dept. A, State Personnel Board, 1015 L St., Sacramento, Calif.

Sanitary and Water Pollution Control Engineers. Technical or administrative positions. 2 to 8 years' experience sanitary and public health engineering in treatment and disposal of sewage and industrial wastes plus college degree in sanitary, public health, chemical, or civil engineering. Must be eligible for California State License. Many positions in California State government at beginning annual salaries $4,092 to $7,356. Official application must be filed by May 20. Dept. D, Recruitment Section, State Personnel Board, 1015 L St., Sacramento 14, Calif.

Health Education Consultant for recently established training center. Salary $4,480–$4,800 depending upon experience and training; 40 hour week; cumulative sick leave; one month annual vacation; M.P.H. required. Program Coordinator, Lawrence-Wabash Health Dept. Training Center, Mt. Carmel, Ill.

Health Officer for prosperous, well organized county in southeastern Michigan near University of Michigan and large cities. Salary range $7,500 to $8,700 depending on experience and training. Board of Health, Lenawee Co. Health Dept., Adrian, Mich.

Assistant Director, TB Control, Graduate of recognized school of medicine; 1 year internship; thorough experience in clinical TB including chest x-ray interpretation; administrative and public health experience desirable but not essential. To be in charge of public health clinic and assist in case finding program. Also connection with TB service of large general hospital and appointment on the faculty of the medical school. Salary range: $6,600 to $7,500 per annum depending on qualifications. **Box A-82,** Employment Service, A.P.H.A.

Public Health Nurse for generalized program in county of 35,000; 100 miles west of Chicago. Salary $255 per month with $65 travel allowance, two weeks sick leave. Good retirement system. President, Lee Co. Board of Health, Dixon, Ill.

Health Educators (two) for established health education unit in official agency of a large metropolitan city—one to do general community health education, working in and from the central office or to work primarily with radio and television, the other to develop a demonstration community organization program in connection with a new health center. Salary $3,564. Master's degree in public health with major in public health education required. **Box A-83,** Employment Service, A.P.H.A.

Public Health Physician as Health Officer of a new single-County Health Department beginning July 1. Opportunity of organizing first staff and programs. County of 20,000 on Mississippi River in northwestern Illinois. Salary range $7,200–$9,000. Qualified health officer may start above minimum. G. Alzeno, D.D.S., President, JoDaviess Co. Board of Health, Stockton, Ill.

Public Health Physician for southern Illinois District Office of State Health Department. University town. Highly capable individual can depend on promotion. Present salary range $480–$638 per month; may start above minimum. Excellent Civil Service and Retirement System. Roland R. Cross, M.D., Director, State Dept. of Public Health, Springfield, Ill.

Public Health Physician as Medical Director of Bi-County Health Department in southwestern Illinois. Important public health job to be done. Reasonable salary. Apply Mr. Lloyd Cannon, Secretary, Alexander-Pulaski Bi-County Board of Health, Cairo, Ill.

Assistant Director of Public Health responsible for venereal disease program and assist with administration of general county health work. Must be eligible for California license and have 1 year of experience in an approved public health agency in control of VD clinic. Preference will be given to candidates having the M.P.H. degree. Starting salary $559 per

month; 40 hour week. Civil Service and Personnel, Co. of San Bernardino, 242 Third St., San Bernardino, Calif.

Physician with public health training, M.P.H. preferred, to assume charge of school health program. Possibility of combining functions as health commissioner with those in the school health program. City of 30,000 population in mid-west. Salary up to $8,000–$9,000, depending on qualifications. **Box A-84**, Employment Service, A.P.H.A.

Health Officer for newly created mid-western City-County Health Department operating under 7 member Board. Estimated population 300,000. Staff of 40 full-time employees exclusive of nurses. Health Officer acts as medical director for the V.N.A. staff of 42. Salary open. Qualifications: M.P.H., and 5 years' experience in public health work in an administrative capacity. **Box A-85**, Employment Service, A.P.H.A.

Public Health Nurses—certificate and year experience. Government field work Southwestern Oklahoma, good location, starting at $3,825 with automatic promotions annually to a top of $4,575. 40 hour week, 1 month paid vacation, sick leave, retirement system, disability compensation, automobile and travel expenses. **Box 139**, Lawton, Okla.

Health Commissioner for Ashtabula County, Ohio, northeastern section of state, population 40,000, mostly rural. Salary $6,500 and car allowance. Thomas E. Patton, M.D., Health Commissioner, Department of Health, Jefferson, Ohio.

Director of Public Health—applicant required to have considerable experience in the field of public health with some responsible experience as an administrator of a public health department. Salary $7,500–$10,000. Leroy J. Brenneman. Personnel Director, Civil Service Dept., Phoenix, Ariz.

Health Officer for generalized program in county of 35,000. 100 miles west of Chicago. Salary $7,200, $65.00 per month travel allowance; retirement system; 3 weeks vacation; 2 weeks sick leave. President, Lee County Board of Health, Dixon, Ill.

Staff Nurses for progressive and expanding health department serving a city and county population of 105,000. 10 nurse staff, program generalized. Department consists of medical, dental, nursing, laboratory, VD clinic, sanitation and home safety divisions. Public health nursing preparation required. Salary $2,900–$3,400 depending on qualifications and experience. Must furnish own car, allowance 6¢ per mile. W. B. Prothro, M.D., Director, Health Dept., Kalamazoo, Mich.

Announcements

Opportunities in New York State

Examinations have been announced for the following biostatistician and medical-social worker positions in the New York State Department of Health. These positions carry all rights of Civil Service, including tenure, attractive retirement benefits and liberal vacation and sick leave allowances. Examinations are scheduled for June 24, 1950, and will be held at convenient locations throughout the country. Since applications should be filed before the end of May, write immediately for further information and applications to either the New York State Dept. of Civil Service, Albany, N. Y., or to Richard H. Mattox, Personnel Director, State Dept. of Health, State Office Bldg., Albany, N. Y.

Senior Biostatistician	$4,638–5,628
Biostatistician	$3,847–4,572
Associate Welfare Consultant (public health)	$4,836–5,826
Senior Medical-Social Worker	$3,847–4,572
Social Worker (medical)	$2,760–3,450

Examinations have also been announced for the positions listed below and applications will be received at any time:

Supervising Tuberculosis Physician	$6,490–7,935
District Health Officer	$6,700–8,145
Assistant District Health Officer	$6,154–6,910
Associate Public Health Physician (TB Control)	$7,278–8,145
Senior Public Health Physician (TB Control)	$6,154–6,910
Associate Public Health Physician (VD Control)	$7,278–8,145

Opportunities in Connecticut

Child Hygiene Physician for State Department of Health. Training in pediatrics or obstetrics required. Public health training or experience desirable. Salary $6,900–8,340.

Clinical Psychiatrist for mental hygiene program of State Department of Health. Training or experience in field of child psychiatry required. Salary $7,020–8,460.

Deputy Commissioner—Preventive Medicine for State Department of Health. Extensive experience in public health work including administrative experience of a high degree required. Salary $8,220–10,020.

For further information regarding above positions write to: William T. Youngberg, Supervisor of Personnel Connecticut State Dept. of Health, Hartford, Conn.

Opportunities in Detroit, Michigan

The Detroit Civil Service Commission announces opportunities in the following classifications:

Public Health Nurses (must have completed public health nurse training)	$3,222–$3,582
Junior Public Health Nurses (must be graduate nurse, able to matriculate in university for public health nurse courses)	$2,876–$3,140
Communicable Disease Nurses	$3,144–$3,462
General Staff Nurses	$3,144–$3,462
Supervisory Nurses	$3,604–$4,537
Medical Technologists	$2,950–$3,967
Nutritionists	$3,300–$3,618
Dental Hygienists (must be licensed in Michigan)	$3,131
Senior Dentists (must be licensed in Michigan)	$5,020–$5,416
Veterinarians	$3,034–$4,068

All above positions are for a 40 hour week, with liberal vacation and sick leave provisions, death and sickness benefits and duty disability allowances. Detroit Civil Service Commission, Water Board Bldg., 735 Randolph St., Detroit 26, Mich.

Opportunities Abroad

Limited number ... sanitary engineers will be accepted for positions in Japan. Positions cover guidance and surveillance of Japanese efforts in all fields of sanitary engineering. Salary $6,400 per year. Free housing provided for principal and family with transportation paid to and from point of hire. Employee must sign two year contract. For details and application form write Chief, Public Health and Welfare Section, General Headquarters, Supreme Commander for the Allied Powers, c/o Postmaster, APO 500, San Francisco, Calif.

POSITIONS WANTED

Sanitarian, B.S. Harvard School of Public Health (1939–41). Experience with municipalities, state health departments and the U.S.P.H.S. in water supply, sewage disposal, milk sanitation, and mosquito control. 2 years in Japan as civilian supervisor of water supply and sewage disposal. **Box S-4,** Employment Service, A.P.H.A.

Physician, woman, experience in pediatrics, school health and clinical tuberculosis work. Interested in position on one of the above phases, northeastern U. S. **Box PH - 19,** Employment Service, A.P.H.A.

Statistician, male, M.P.H. 2 years of statistical experience in health department and in the teaching of public health statistics. Educational training in mathematics and the biological sciences. Interested in opportunity with official or voluntary agency. **Box ST-4,** Employment Service, A.P.H.A.

Community Organization or Executive position with voluntary or official agency. 3½ years' experience with health and social agencies, organizing activities on neighborhood, district, and state levels. 4 years' experience practice of law, 4½ years experience in welfare work. Master's degree in social work. Male, 41, married, 2 children. **Box HE-23,** Employment Service, A.P.H.A.

Bacteriologist, male, M.S., 3 years' experience in public health laboratory, 8 years' experience in Army laboratories. Interested in medical and public health bacteriology. **Box LD-10,** Employment Service, A.P.H.A.

Public Health Hospital Administrator. Young man, single, free to travel, premedical training at Boston University. Excellent record 6 years U. S. Army Medical Dept., supervision-management hospital administrative service. Capable planning improvement of hospital facilities, Public Health Instructor, Hospital Administration lecturer, full responsibility hospital management. **Box C-15,** Employment Service, A.P.H.A.

Public Health Dentist, M.P.H., 33, experienced in directing public health dental programs; 3 years' experience in clinical dentistry in Army; desires public health dental position at state or local level. **Box D-1,** Employment Service, A.P.H.A.

Veterinarian–M.P.H., 2 years' experience in federal meat inspection; 3 years' experience in milk and bacteriological laboratory (including teaching) in large university. Will consider opportunities at state or local level or institutional. Available between July 1 and August 1. **Box V-8,** Employment Service, A.P.H.A.

Advertisement

All communications should be sent to Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.

Opportunities Available

PHYSICIANS WANTED—(a) Epidemiologist to direct contagious disease control division including epidemiology and maternal and child welfare; city of 450,000, university center, West. (b) Chief of bureau of preventive medical services; county health department. (c) Public health physician to take charge of school health program; town of 30,000; 5,000 school children; Middle West. (d) Public health specialist; city (200,000) health department; staff of seventy; $10,000. (e) Director, student health department currently being directed by physician on part-time position; coeducational college, 3,500 students; Southeast. (f) Public health specialist to divide time between teaching public health and preventive medicine in medical school and carrying out administrative duties in city-county health department; university medical center, South. (g) Director of public health; generalized program including public health engineering, nursing, education, laboratory, and statistics; staff of 25; department adequately financed; town of 35,000; short distance from university city; South. **PH5-1**

WANTED—(a) Director and assistant director, division of public health education; state health department; former requires three years' administrative public health experience; Master's degrees essential. (b) Public health engineer; administrative appointment; state department of health; considerable traveling; minimum $6,000–$7,000; headquarters, university town. (c) Health educator; city department of public health education; university center; Middle West. (d) Tuberculosis rehabilitation coördinator; large sanatorium, East. (e) Health educator; well organized department of health; staff of 200; large city in the West; university center. **PH5-2**

WANTED—(a) Director of public health nursing; generalized program; Chicago area; minimum $4,000. (b) Student health nurse; liberal arts college for women; quarters available on campus; September appointment. (c) Public health nursing administrator; to direct city-county health unit with medical clinics for care of indigent; department operated jointly by health department and medical society; should be qualified to direct staff of 17; college town of 100,000, Midwest. (d) School nurse; district consists of elementary grades, enrollment more than 1,300; 40 week school year; residential town, short distance from Chicago; September. (e) Director of public health nursing program; outstanding opportunity with eastern university. (f) To direct school health program, public schools; small town located on coast of California. (g) Public health nurse to serve as supervisor of nurses; county health department; generalized program, delightful location, California; $4,200–$4,800. **PH5-3**

Opportunities Wanted

Health educator; Master's degree, Public Health, Eastern university; four years, health educator, county health department; three years, health coordinator, liberal arts college; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Public health engineer; B.S. (Chemical Engineering); M.S. (Sanitary Engineering), Harvard; three years, research chemist in industry; seven years, industrial hygiene engineer in supervisory capacity, state health department; prefers administrative and supervisory position with opportunity for field work and research; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Public health dentist; several years, private practice; six years, director, dental division, state health department; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Public health nursing administrator; B.S. (Nursing Education); M.P.H.; three years' rural nursing; four years, supervisor, city-county health unit; past several years on faculty, university school of public health nursing; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Public health physician particularly well qualified in health education; several years, superintendent of public schools before entering medical school; M.P.H., eastern university; five years, director, city metropolitan health department; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

Young woman physician is available for teaching or administrative post in health and physical education; B.S. (Physical Education); M.A. (Education); ten years' teaching experience in physical and health education before entering medical school; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

NEWS FROM THE FIELD

NEWS OF WHO—A MEDLEY

New York Laboratories Become Regional Laboratory for Influenza Program—The Laboratories for Virology of the New York State Health Department's Division of Laboratories and Research have been asked by the Advisory Committee administering the Influenza Study Program of WHO to serve as one of nine special Regional Laboratories for North America. The Middle Atlantic area to be served includes New York, New Jersey, Eastern Pennsylvania, Delaware, Maryland, and the District of Columbia. Irving Gordon, M.D., is the director of the Laboratories for Virology.

The Special Regional Laboratories are responsible for the program in their respective areas by enlisting the assistance of other laboratories; distributing specific influenza antigens and antisera to their area collaborators; and identifying as influenza virus those agents isolated by themselves or by the collaborating laboratories.

Expert Committee on Environmental Sanitation—WHO has an Expert Committee on Environmental Sanitation with responsibility for the preparation of a comprehensive, proposed program of environmental sanitation. Its chairman is Abel Wolman, head of the Sanitary Engineering Department of Johns Hopkins University. This committee held a first meeting in Geneva in September, 1949, and prepared a report which was later accepted by WHO's Executive Committee. Those present, besides the chairman were: Rafael De Leon, Venezuela; George MacDonald, United Kingdom; Milivoj Petrik, Yugoslavia, Rapporteur; V. Puntoni, Italy; K. Subrahmanyan, India; and Sol Pincus, Secretary.

The full report of this committee has been published in the March, April, and May issues of *Modern Sanitation*, from which reprints are available (855 Avenue of the Americas, New York 1). The full report will also be issued as No. 10 of a Technical Report Series being published by WHO covering all Expert Committees. International Document Service, Columbia University Press, 2960 Broadway, New York.

Nutrition Studies in Central America—At the recent meeting of the Institute of Nutrition of Central America and Panama, under the auspices of the Pan American Sanitary Bureau, two nutrition studies were approved for the region. One concerns the effectiveness of the new Vitamin B_{12} in enabling locally available vegetable protein to be used as effectively for the growth and development of children as animal protein, which is desperately short in that region. A second study will explore reasons for the anomaly by which in this region serum protein does not reflect low protein intakes. On the contrary, serum protein values tend to be far higher than in well fed groups in the United States.

Fellowships to 207 Health Specialists—WHO in 1949 awarded fellowships to 207 doctors, nurses, and other personnel of 35 countries. The largest number, 104, went to European countries of which one-fourth went to Yugoslavia specialists. The number of countries to which the specialists were assigned for study was also increased; the number studying in the United States was 26 per cent, whereas before 1949 it had been 40 per cent.

Concern With Personnel Shortages—An eleven man Expert Committee on

Professional and Technical Education of WHO met in Geneva in February to draft measures for combating the world-wide scarcity of medical and auxiliary personnel. Gaylord Anderson, M.D., Director of the Minnesota University School of Public Health, is the Vice-Chairman of the committee, Professor René Sand of the University of Brussels is chairman and Dr. J. Mackintosh, director of the London School of Hygiene and Tropical Medicine is rapporteur. Among other members are Dr. Mudaliar of India, Dr. DePaula Souza of Brazil and Dr. Stampar of Yugoslavia.

Among the recommendations made by the committee was one calling for a change of emphasis in present medical training so that the student may gain insight into the socio-economic aspects of health problems through contacts with home and community life. The committee pointed out that in areas inhabited by half the world's population, the ratio of physicians to population is as low as one to 12,000. It made plans for giving assistance to countries in developing medical schools, organization of group training in various regions, fellowship programs, and providing experts and lectures to develop teaching methods and technical training.

Modernizing World Sanitary Rules—A subcommittee of the WHO's Expert Committee on International Epidemiology and Quarantine met in Geneva in February to draft international sanitary regulations to replace the several sanitary conventions now in use. The new regulations, applicable to all means of international transport, aim to insure maximum security against transmission of epidemics and minimum interference with world traffic. The draft regulations will be transmitted to governments for comments and then will be submitted to the full Expert Committee on Epidemiology and Quarantine before the end of 1950. It is expected that the final text will be ready for the fourth World Health Assembly in the spring of 1951. Members of the subcommittee are: chairman J. Hostie of the Belgium Foreign Office; H. B. Calderwood, U. S. State Department; Miss J. A. C. Gutteridge, assistant legal adviser, of the London Foreign Office; and J. Secretan, professor of law, Lausanne, Switzerland.

WHO in the Press—Collier's Magazine of January 28, 1950, has "U. N.'s Merciful War," a graphic description of the fight WHO is carrying on round the world against malaria, syphilis, tuberculosis, cholera, plague, and the effect success in the war should have both on individual well-being and on the economy of various nations. It ends with these words from WHO's general director, Brock Chisholm, M.D., "WHO's job is pretty much the same as the job of an anopheles mosquito. We're starting an epidemic—an epidemic of health for the world." The *Journal of the American Medical Women's Association* for November, 1949, has a four page summary of 1949 activities of WHO, reprints of which have been made (50 West 50th St., New York 22).

PIONEERING IN RESEARCH STIMULUS

The Social Science Research Council has announced two new ventures in supporting research with the purpose of keeping in research those persons with special talents in this field. Beginning with the academic year 1950–1951, the Council is beginning a five year program of Faculty Research Fellowships. These "are designed to enable younger members of social science faculties of universities and colleges who have superior qualities for research, to devote a substantial part of their time to self-directed research early in their professional careers, while remaining in residence at their own institutions and carrying on a restricted amount of teaching." Appointments of persons with Ph.D. degree in social science or its equivalent, regular members of university or college teach-

ing staffs, preferably not over 35 years of age, will normally be made on a three year basis. Both the abilities of the individual and the conditions under which he will work are factors determining the selection. Applications, which may be initiated either by the individual or his university, should be addressed to Elbridge Sibley, Executive Associate, Social Science Research Council, 726 Jackson Place, N.W., Washington 6.

The second program being pioneered is that of interuniversity summer research seminars. In these, young professors will be able to spend the summer recess in hard study and research rather than routine teaching. In the summer of 1950 three experimental seminars will be held, one on old age research at the University of California in Berkeley, one at the University of Chicago on appraisal of concepts and techniques useful in analyzing major agricultural economic problems, and one at Dartmouth College to appraise the status and current problems of learning theory. Small groups of professors have been selected for these seminars and the Council will provide the essential margin of income while giving them the opportunity to develop themselves and their field of knowledge.

SUMMER WORKSHOPS

(Announcements as received by March 31)

School Health Education, Graduate Seminar, Yale University, New Haven, Conn., June 26–August 4 (plus two weeks for preparation of term papers and project reports) 8 points of credit. Tuition, $120. Scholarships available to Connecticut personnel through Connecticut Tuberculosis Association, 43 Farmington Ave., Hartford. Directors, Charles C. Wilson, M.D., professor of education and public health, and Joseph K. Hill, Ph.D., instructor in public health, Yale University. Apply Clyde M. Hill, Chairman, Department of Education.

Community Nutrition Institute—Syracuse University, Syracuse, N. Y., June 19–July 1. Inservice program in public health nutrition for physicians, community nutritionists, public health nurses, nutrition instructors, and health educators. Two hours credit possible. Directors, Dr. Anne Bourquin, Syracuse University (Syracuse 10), and Marguerite J. Queneau, New York State Department of Health. Approximate total cost $100. Apply to Dr. Bourquin.

The Health Needs of the Child as He Enters School, and Through His Early Adolescence, Kansas University, Lawrence, June 19–25 (extended to June 30 for those who desire 2 hours University credits). Leader, John Bracken, Clayton (Mo.), Superintendent of Schools. Fee only for those desiring University credit. Apply May Hare, Health Education Coördinator, Kansas State Health Department, Topeka.

Family Living and Sex Education—University of Pennsylvania with the cooperation of the U. S. Public Health Service and the Pennsylvania State Department of Health, June 26–July 28. For teachers, counsellors, social and public health workers. Director, John H. Stokes, M.D., University of Pennsylvania, 34th and Locust Sts., Philadelphia 4.

1950 Institute for Annual Review of United Nations Affairs, New York University, June 26–30. Day sessions at Lake Success, evening sessions at the University. $15. Inquire Dr. Clyde Eagleton, director of Program in United Nations and World Affairs, New York University, New York 3.

Conference on American Foreign Policy, Colgate University, July 7–13.

Round table plenary sessions, and luncheon discussion on "American Foreign Policy: An Offensive for Freedom." Total cost, $50. Apply Dr. Charles R. Wilson, Director, Colgate University, Conference on American Foreign Policy, Hamilton, N. Y.

FELLOWSHIP FUND IN HOSPITAL ADMINISTRATION

Hadassah, the Women's Zionist Organization of America, Inc., New York City, announced recently the creation of a $5,000 fellowship fund in hospital administration in honor of Dr. E. M. Bluestone, Director of Montefiore Hospital, New York City, to enable Israel students to study hospital administration in the United States. The fund was set up by Hadassah "in appreciation and gratitude for the twenty years of selfless service Dr. Bluestone has given to the Medical Reference Board of Hadassah and the Hebrew University, eleven of the years as Chairman." An additional $1,000 has been designated for a project to be agreed upon to advance the frontiers of medical science.

AMERICAN BOARD OF NUTRITION

According to an announcement made late in March by Otto A. Bessey, Ph.D., of Chicago, a new certifying board, the American Board of Nutrition, has been set up "to establish standards of qualifications of persons as specialists in human nutrition and to certify as such persons who comply with the standards." The new Board apparently is not set up under the Advisory Board for Medical Specialties since it includes qualifications of some persons who are not physicians. Those concerned with the establishment of the Board included representatives from the American Institute of Nutrition, American Medical Association, the American Public Health Association, American Society of Biological Chemists, Inc., and Association of American Medical Colleges. Present members of the board are Otto A. Bessey, C. A. Elvehjem, Wendell H. Griffith, C. G. King, L. A. Maynard, Fredrick J. Stare, and John B. Youmans. Requirements for admission to examination and certification are as follows: (1) citizenship in the United States or Canada; (2) presentation of evidence of satisfactory moral and ethical standing; (3) Ph.D. in a biological science or M.D. degree from an approved school; (4) courses or training equivalent to a minimum of three semester hours in at least three of the following five subjects—food technology, microbiology of food, human physiology, large-scale food preparation and hospital dietetics; (5) three years' experience in the practical aspects of human nutrition. Qualified candidates will be considered for certification without examination until June 30, 1951. Prescribed forms for application and further information from the office of the Secretary-Treasurer, Dr. Otto A. Bessey, University of Illinois College of Medicine, 1853 W. Polk Street, Chicago 12, Ill.

NEW HEALTH INFORMATION GROUP

A new organization for the dissemination of information on health problems was recently organized. Called the Health Information Foundation, it is supported financially by pharmaceutical and allied firms. Its president is Admiral William H. P. Blandy, recently retired from the Navy. Headquarters have been set up in New York City (420 Lexington Ave.) with Kenneth Williamson as Executive Secretary. Herbert Hoover is Chairman of a citizen's advisory committee.

The Charter lists specific purposes primarily in the direction of encouraging voluntary prepayment medical care plans. They may be paraphrased as follows:

1. To make medical services increasingly available without sacrifice of quality.
2. To coöperate with groups concerned with

medical care in determining the adequacy of existing medical facilities.

3. To advocate additional provisions, under local auspices, for training of more physicians, dentists, pharmacists, nurses, and allied scientists, and for more hospital facilities, diagnostic centers, public health facilities, and any other facilities for better health care for all persons, including those unable to pay.
4. To help in formulating workable programs for insuring adequate preventive and corrective medical care for everyone through coöperation with existing facilities.
5. To distribute information on methods of protecting families against the hardships of sickness and accident by individual or group insurance and to promote voluntary prepayment plans for providing health and hospital services.
6. To make available information about medical facilities and how people can make the best use of them.

ARTHROPOD-BORNE DISEASE COURSE AT HARVARD

According to John C. Snyder, M.D., Professor of Public Health Bacteriology, Harvard School of Public Health, Boston, a new course has been developed to be given by Dr. H. S. Fuller under the joint sponsorship of the Departments of Tropical Public Health and Public Health Bacteriology in the School of Public Health. Its title is Arthropod-Borne Diseases.

According to Dr. Snyder, particular attention will be given to arthropods as vectors in the effort to integrate entomology with microbiology and with human disease. The course will include basic principles of morphology, physiology, behavior and ecology of arthropods, as well as control measures. Included will be studies with living hard ticks, soft ticks, parasitoid mites, trombiculid mites, human body lice, bedbugs, reduviid bugs and fleas, adult and larval mosquitoes and flies.

LIVING AND GROWING OLD

The third annual Institute on Living in the Later Years will be held June 28–30 at Ann Arbor. The Institute for Human Adjustment with the coöperation of the Extension Service of the University of Michigan will provide exploration into mental health, medical, and education problems of an aging population. Information from University of Michigan Extension Service, 4524 Administration Building, Ann Arbor.

GARBAGE DOWN THE DRAIN

Jasper, Ind., is a town of about 7,000 inhabitants. On August 1, it will stop collecting garbage through a city-sponsored project of individual sink drain garbage grinders in homes. It is said to to be "the first city in the country with garbage disposal relegated to the kitchen." Arrangements were made by the city for furnishing these to home owners at half price. Heretofore garbage has been collected by farmers to feed to their hogs but there has been complaint about rats and flies. A new ordinance is setting up strict garbage disposal regulations for those who do not have the sink units.

DOCTORS OF INDUSTRIAL MEDICINE

What are reported to be the first degrees of Doctor of Industrial Medicine were recently granted three physicians by the University of Pittsburgh School of Medicine. The recipients were:

Harley S. Gibbs, director, medical division, Carnegie Illinois Steel Corporation
Dolor J. Lauer, medical director, National Lead Company
James H. McDonough, medical director, Rome Cable Company

WEST VIRGINIA HEALTH OFFICERS

At a recent staff conference in Charleston, the Health Officers' Association of West Virginia was organized with Dr. Guy Post, health officer, Wood-Parkersburg Health Department, as president. Other officers elected were Dr. J. M. Coram, health officer, Raleigh County, Beckley, Vice-President; Dr. Luke Frame, health officer, Cabell-Huntington Health Department, Secretary; and Dr. R. M. Doddrill, health officer, Health

District 4, as Treasurer. The functions of this association will be similar to the State and Territorial Health Officers' Association, with state and local administrators getting together periodically to discuss pertinent health problems.

ALASKA'S TRAIN HEALTH UNIT

The Alaska Territorial Department of Health has added a 2 car railroad unit to its 2 steamer mobile service. The unit offers immunizations, blood tests, health education, children's dentistry with routine topical applications of fluoride, and emergency medical care. Beginning in November, 1949, it travels between Nenana and Seward and in May its staff transfers to the Yukon steamer. Alaska Railway officials provided the railway cars.

HEALTH COUNCIL GROUP REORGANIZES

The Conference for Health Council Work is the new name for the former Committee of Health Council Executives. It is made up of some 70 persons "employed in a health council or interested in the health council idea." It holds two meetings annually, one with the American Public Health Association and one with the National Conference of Social Work.

Its purposes are to provide for exchange of experience, coöperate in developing personnel standards, to recruit health council personnel, to clarify relations between health and other community coördinating bodies, to develop criteria for evaluating health council programs, and to stimulate the growth of health councils.

The chairman of the Conference is Alexander Ropchan, executive secretary of the Health Division of Chicago's Welfare Council. Its secretary-treasurer is Mrs. Alice H. Sanders, secretary of the Health Division, Milwaukee County Welfare Council, 797 N. Van Buren St., Milwaukee 2, to whom inquiries regarding membership should be addressed.

ANOTHER NEW YORK COUNTY ORGANIZES

On March 1, the Albany City-County Health Department of New York began operation, thus becoming the 7th County to organize since the passage of the 1946 law providing for additional state aid to county health departments. The department now serves the entire county including 10 towns and three cities with a total population of about 250,000, about 100,000 of whom had hitherto not had a full-time health officer.

The former health Commissioner of Albany City, Simon J. Gormley, M.D., is the Commissioner of the new county department. Deputy Commissioner is Dr. Norbert P. Ringelmann, former state district health officer in the Albany district.

EYE SAVING IN THE AMERICAS

"The Americas Unite to Save Sight —A Mid-Century Conference on Progress" was the title of the recent joint meeting in Miami Beach of the National Society for the Prevention of Blindness and the Pan American Association of Ophthalmology, the former 32 and the latter 10 years old. Attended by more than 500 eye doctors and prevention of blindness workers from North and South America, this was the first time the two organizations met jointly. They were there to measure progress during the first half of the century and to map strategy for the next 50 years. Some 35 physicians from the Americas outside the United States were speakers, discussion leaders, and discussants.

Among the events were a symposium each on trachoma, secondary glaucoma, blindness in premature babies from retrotental fibroplasia, and parasitic diseases; panel discussions on teamwork for prevention and on industrial eye problems. There were also five minute reports from each of the American republics.

The President of the National Society for the Prevention of Blindness, Mason

H. Bigelow, said that, by the full use of knowledge we already possess, sight could be saved for at least half of the 220,000 persons in the United States who may become blind in the next ten years. Conrad Berens, M.D., president of the Pan American Association said this joint meeting was a pioneer effort to coördinate activities throughout the hemisphere.

AMA'S SCHOOL HEALTH CONFERENCE

In October, 1949, the Bureau of Health Education of the American Medical Association held its second national conference on Physicians and Schools. Nearly 200 persons attended, representing more than 100 organizations from 40 states—medical societies, state departments of health and education, and national health agencies.

Discussion sessions developed around the following purposes:

1. Evaluating progress in the development of school health services since the first Conference in 1947.
2. Agreement on methods of working together to improve school health service.
3. Stimulation of joint action by medical, public health, and educational interests to develop sound school health services.

A summary of the recommendations follows:

1. That two recommendations of the 1947 Conference be reaffirmed and everything possible done to carry them out.
   a. Teacher training institutions should provide efficient health service and instruction in child growth and development, should utilize community resources in training teachers for their health responsibilities, should educate all teachers to contribute to the health program, and should establish a coördinating health council.
   b. Medical schools should give additional education in
      (a) relation of the physician to the school and community
      (b) physiology of exercise
      (c) pediatric examination
      (d) the school physician's function as a medical adviser
2. Local medical societies should participate fully in making school health policies and in establishing school health councils.
3. Both state and local medical societies should establish school health committees.
4. The highest sanitary standards for the maintenance of pupil health should be enforced in the construction of school buildings and every school should have proper facilities for the use of the school physician and nurse.
5. That the Rural Health Committee of the American Medical Association study methods of improving rural school health services as a part of its consideration of rural health problems.
6. That summaries of outstanding examples of good school health programs be published and widely distributed.
7. That the Conference endorse and support the statement of policy in regard to frequency of school health examinations as outlined in *Suggested School Health Policies*, namely, that school children have at least 4 medical examinations during school years, one each at entrance, in the intermediate grades, at adolescence, and before leaving school. Pupils with serious defects, or those who have had serious or repeated illnesses, or who take part in vigorous athletic programs require more frequent examinations. More frequent, or even annual examinations may be desirable, but the quality of examinations should not be sacrificed to frequency.
8. Medical examinations are the province of the family physician and should be done by the school staff only when no provision for a family physician can be made.

The Proceedings of the Conference are available from the American Medical Association, Chicago 10.

A.S.H.A. AWARD TO GEORGE J. NELBACH

George J. Nelbach, Consultant to the New York State Committee on Tuberculosis and Public Health and for 36 years its secretary, was honored with a life membership in the American Social Hygiene Association at its annual meeting in New York City on February 1. The award was presented by Philip A. Mather, President of the A.S.H.A., at the regional conference luncheon at the Hotel New Yorker. Dr. Walter Clarke, Executive Director of the A.S.H.A., said the life membership was in recognition

of Mr. Nelbach's leadership and outstanding contributions in the public health field.

HUMAN RELATIONS IN PLANT SAFETY

The University of Michigan School of Public Health announces an inservice training course on Industrial Hygiene and Human Relations for Safety Personnel. The focus will be on human relations in accident prevention, a topic not dealt with in the earlier course in this series. The emphasis will be on recognition, rather than correction, of health exposures for which the advice of industrial hygienists should be utilized. June 19–21—Enrollment fee, $5.00. Further information from H. E. Miller, School of Public Health, University of Michigan, Ann Arbor.

AWWA ELECTS OFFICERS

The American Water Works Association has elected the following officers to serve for the year beginning at the conclusion of the next annual conference, May 26, 1950. President: W. Victor Weir; Vice-President: A. E. Berry, Ph.D., C.E.; Treasurer: William W. Brush. Dr. Berry is a Fellow, and Mr. Brush a member of A.P.H.A.

INDUSTRIAL WASTES CONFERENCE

The Massachusetts Institute of Technology, through its Department of Civil and Sanitary Engineering, will hold a New England Industrial Wastes Conference, June 26–28. Joint sponsors are the New England Council and the New England Sewage Works Association. Problems of the different groups involved in stream pollution control will be discussed. Further information from Professor Rolf Eliassen at the Institute, Cambridge, Mass.

NEW PUBLIC HEALTH SCHOOL FOR NEW YORK STATE

Governor Thomas E. Dewey of New York announced on April 5 that among the new facilities to be created under the State University of New York would be a school of public health. This will be in addition to the medical and dental schools already planned.

The Governor's announcement was made at the occasion when the Long Island College of Medicine, Brooklyn, was merged with the State University of New York. A similar merger will follow shortly with the Syracuse University School of Medicine. Governor Dewey did not indicate where the new school of public health would be located nor when it was expected to be opened.

The State University of New York is the outcome of decisions reached since the close of the war by the New York State Legislature. The University now consists of 32 units scattered across the state, including more than 30,000 students. It is the youngest state university but the total enrollment is said to be seventh among the universities of the United States. The State University of New York is not to be confused with "The University of the State of New York" which has been in existence for many years as an administrative unit of the New York State Government.

RESEARCH IN LABORATORY METHODS FOR INDUSTRIAL WASTE WATERS

The Federation of Sewage Works Associations is now in the third year of a comprehensive research program being conducted in seven university laboratories for the purpose of (a) evaluating the accuracy and precision of existing methods for the analysis of waste waters, and (b) developing new or improved methods. Major emphasis is being given to Industrial wastes. Funds for the program totaling about $125,000 for the three years have been provided by the National Institutes of Health.

The Sewage Works Association along with the American Water Works Association is joining with the American Public Health Association in sponsoring

the revision of the Ninth Edition of *Standard Methods for the Examination of Water and Sewage*. Its research, therefore, will be valuable in the preparation of the new chapter on industrial wastes. Such a chapter was agreed upon by the Joint Editorial Board in December, 1948, in view of the increasing urgency of stream pollution control.

HONORARY DEGREE TO DR. SCHEELE

The degree of Doctor of Science was conferred on Leonard A. Scheele, M.D., Surgeon General of the U. S. Public Health Service, at the midyear commencement exercises at Wayne University on February 2 in Detroit. Dr. Scheele, who is a graduate in medicine from Wayne University in 1933, has been in the public service since that time.

PERSONALS

FRANK C. CADY,† D.D.S., M.P.H., Dental Director, U. S. Public Health Service and Dental Consultant for Public Health Service Regions 1 and 2, will retire from the Service on completion of 30 years' service, June 1.

AIME COUSINEAU, C.E.,* Director, City Planning Department, Montreal, Canada, has been elected president of the Institute of Professional Town Planners.

H. ANTHONY DAHLSRUD, M.D., has been appointed Colusa County (Calif.) Health Officer, succeeding ALBERT E. RAITT, M.D.†

JEAN R. EGBERT, has returned to the Colorado State Department of Public Health as Maternal and Child Health Advisory Nurse after 5 years as director of the Maternal Health Center in Santa Fe, N. M.

LT. COL. MARCUS H. FLINTER, M.C.,† formerly with the Institute of Inter-American Affairs as Chief of Party in Honduras, Central America and Colombia, South America, has resigned to accept a commission in the regular army as Medical Officer of the Mission and Advisor to the Ministry of National Defense of Venezuela, S. A.

ALFRED L. FRECHETTE, M.D.,* formerly director Brookline (Mass.) Health Department, has become director of the Health, Hospitals and Medical Care Division of the United Community Services of Boston.

LILLIAN GOODSTEIN, formerly librarian at Western Illinois State College, Macomb, Ill., has become public health librarian, Colorado State Health Department.

DENNIS GROOME, Senior Assistant Surgeon (R) U. S. Public Health Service, is on loan to the Louisiana State Health Department as acting chief, Section on Venereal Disease Control.

EDWARD G. HAMPP, D.D.S. of the Oral Bacteriology Section, National Institute of Dental Research, and senior research associate of the American Dental Association, has been presented by the Washington (D.C.) Academy of Sciences with the 1949 Academy Award in the biological sciences, "in recognition of his original and fundamental contributions to the knowledge of diseases of the oral cavity, and particularly because he was the first to isolate *Borrelia vincentii* in pure culture, thus making possible new approaches to the study of spirochetes."

H. R. HANCOCK, R.S., for the past two years sanitarian in the Madera County (Calif.) Health Department has opened an office as a sanitation consultant in Madera.

H. M. HARDWICKE, M.D.,† has been appointed chairman of the Stephens College Division of Health and Physical Education, Columbia, Mo.

HARRIET LOUISE HARTLEY, M.D., D.Sc.,* who is retiring as chief of the Division of Child Hygiene, Philadelphia Health Department, after 33 years of distinguished and devoted service, Philadelphia Health Department, was honored with a testimonial dinner January 17.

CLARICE HAYLETT, M.D., has been appointed Health Officer for Marin County (Calif.) succeeding IRVING D. JOHNSON, M.D.†

DORIS MARIE JURGENSON, R.N., B.S., formerly nursing consultant in public health, Institute of International American Affairs in Haiti, is the new consultant nurse, Division of Public Health Nursing, Indiana State Board of Health.

P. M. KAUL, M.D., who has been a member of the Indian Medical Service since 1934 and in 1947 was director of the WHO Singapore Epidemiological Intelligence Station, has been appointed chief of the New York Liaison Office of the World Health Organization, succeeding FRANK A. CALDERONE, M.D.*

CARL C. KUEHN, M.D., M.P.H.,† is the new director of the Division of Preventive Medicine, Louisiana State Health Department.

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* Fellow A.P.H.A.
† Member A.P.H.A.

He was formerly director of Tuberculosis Control and Venereal Disease Control, Indiana State Board of Health.

WILLIAM F. LITTLE, will receive the 1950 Gold Medal of the Illuminating Engineering Society at ceremonies during the National Technical Conference at Pasadena, Calif., August 21–25, "for meritorious achievement conspicuously furthering the profession, art, or knowledge of illuminating engineering."

GORDON W. MOLYNEUX * formerly Manager, Rock Gate Farm Dairy, Bedford Hills, N. Y., has been appointed supervising milk and food sanitarian, Bedford Hills Department of Health, succeeding AARON APPLEBY, D.V.M.,† who resigned to enter private practice of veterinary medicine.

ALVIN R. LEONARD, M.D.,† formerly on the staff of the California State Department of Public Health, has been named Assistant Director of Public Health, San Diego City-County Health Department.

HARRY A. NEVEL, M.D.,† formerly in private practice in San Diego and most recently doing physiology research at the University of Southern California, is the new chief of the division of preventive medicine, San Diego City-County Health Department.

MAJOR GENERAL IRVING J. PHILLIPSON, USA (Ret.), received the William Freeman Snow medal for distinguished service to humanity at the recent meeting in New York of the American Social Hygiene Association.

JOSEPH F. RUDMIN, M.D.,† formerly practising physician and part-time health officer, has joined the New York State Department of Health as a resident in public health practice (Epidemiologist in Training).

MAJOR GENERAL SIR SAHIB SINGH SOKHEY, director of the Haffkine Institute at Bombay, has been appointed Assistant Director-General of the World Health Organization, in the Geneva headquarters office.

ROGER F. SONDAG, M.D.,* director of the Bureau of Preventable Diseases, Florida State Health Department since August 1945, is now health officer of Jackson County, Ill.

MILDRED STRUVE, senior nurse officer in the commissioned corps of the Public Health Service and director of nursing services, U. S. Marine Hospital, Seattle, Wash., has been made director of nursing services for the Clinical Center under construction at the National Institutes of Health, Bethesda, Md.

F. WILLIAM SUNDERMAN, M.D., formerly professor of experimental medicine and clinical pathology and investigator in experimental medicine, in the Postgraduate Medical School of the University of Texas, has joined the staff of the Communicable Disease Center, Public Health Service, in Atlanta, where he will be concerned with setting up standardized methods in laboratory medicine.

CATHERINE VAVRA, M.P.H.,† formerly director of health education, Tuberculosis and Health Society of Wayne County, Mich., has been appointed assistant professor, Department of Public Health and Preventive Medicine, School of Medicine, University of Washington, Seattle.

ROBERT L. WALKER, M.D., has recently joined the New York State Department of Health as a resident in public health practice. He is now assigned to the Geneva district office.

RAYMOND E. WILSON, Ph.D., has been appointed chief of the temperature measurements section of the National Bureau of Standards, Washington, D. C., with responsibility for the maintenance of the International Temperature Scale and the calibration and standardization of temperature measuring instruments.

The following appointments have been made to the staff of the Graduate School of Public Health, University of Pittsburgh:

FRANCIS SARGENT CHEEVER, M.D.,† as professor of Microbiology in the Department of Epidemiology and Microbiology. He was formerly assistant professor of Bacteriology and Immunology, Harvard Medical School.

WILLIAM H. RAY, research associate, to head the physics laboratory of the Department of Occupational Health. He was formerly in the Health Physics Division, Oak Ridge National Laboratory.

GLADYS E. SATHER,† research associate, Department of Epidemiology and Bacteriology. She was formerly principal technician, Hooper Foundation, University of California.

DEATHS

CHARLES C. AGAR,† associate sanitary engineer, and chief of the water pollution section, Bureau of Environmental Sanitation, New York State Department of Health, died on February 15 (Engineering Section).

ANN DICKIE BOYD, R.N., B.A.,* School Nurse, Denver (Colo.) Public Schools, died recently (Public Health Nursing Section).

HENRY E. BREEDLOVE, M.S.S.E.,* Public Health Engineer and director, Division of Sanitation, Mobile County (Ala.). Board of Health, died at the age of 42.

LUIS GAITAN, M.D.,† Guatemala City, C.A. (Public Health Education Section).

CONFERENCES AND DATES

American Public Health Association. Headquarters, Kiel Auditorium, St. Louis, Mo. October 30–November 3.

Coming in May, June, and July: